The Effects of Job-Related Strains and Stressors on Mental Health Symptoms in National Guard Veterans Returning from Iraq

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Tamara Schult, MPH

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Patricia M. McGovern, PhD, MPH, Advisor
Bryan E. Dowd, PhD, Co-Advisor

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Abstract

Objectives: Civilian reintegration is the process of military personnel transitioning back into personal and organizational roles following deployment. Our newest generation of veterans is faced with the task of reintegrating into potentially disrupted family, social, and occupational roles. Civilian reintegration may be particularly challenging for National Guard and Reserve (NGR) component service members. A key feature of the reintegration process in this population is the transition away from and back to civilian employment. Issues related to employment, including job concerns, job change, job stress and job support, may be important risk factors in the development of post-deployment mental health symptoms. The aim of this dissertation research was to examine, in a cohort of NG military veterans returning to civilian work after deployment to Iraq, these job-related issues and their role in the development of post-deployment mental health symptoms.

Methods: We utilized prospective, longitudinal data from the Readiness and Resilience in National Guard Soldiers (RINGS) study, a study of risk and protective factors associated with post-deployment functioning. Pre-deployment data was collected in a cohort of 522 National Guard soldiers from a single brigade one month prior to deployment to Iraq (Time 1). Troops were deployed from March 2006 to July 2007. Post-deployment data was collected by mailed self-report questionnaires 2-3 months after brigade return (Time 2), and again approximately one and two years later (Times 3 and 4). A total of 424 veterans (81%) completed Time 2 questionnaires, 343 veterans (66%) completed Time 3 questionnaires, and 296 veterans (57%) completed Time 4 questionnaires. A smaller occupational cohort completed two interviews following completion of the Time 2 and Time 3 mailed questionnaires; a total of 355 completed an interview after Time 2 that gathered information on pre-deployment work history and current occupational status. Of those, 297 (84%) completed a second interview on occupational functioning after completing the mailed questionnaire at Time 3, and 208 (59%) completed the final mailed questionnaire at Time 4. Both dissertation papers estimated models with the same dependent variables, post-traumatic stress disorder (PTSD) as assessed with the PTSD Checklist – Military Version (PCL-M), and depression, as assessed with the Beck Depression Inventory-II (BDI-II). Linear regression models were employed to examine the effects of job concerns, job stress, and job support on post-deployment symptoms of PTSD and depression. A "differences-in-differences" model was used to determine whether a post-deployment civilian job change affects post-deployment symptoms of PTSD and depression.

Results: We found significant correlations and significance in multivariate models controlling for demographics and combat exposure between job concerns and symptoms of both depression and PTSD; this was particularly true when job concerns were assessed prior to deployment. Job change had no significant effect on symptoms of either PTSD or depression, in contrast to our hypotheses. Finally, results indicated that perceived job stress and poor coworker support contribute to symptoms of depression in NG veterans over two years after returning from Iraq. Job stress may also contribute to an increase in symptoms of PTSD in some NG veterans.

Conclusions: NGR veterans face unique challenges post-deployment as their military service is relatively part-time and they retain commitments to civilian jobs despite involvement in protracted or multiple deployments. We've identified the pre-deployment time period as a potential time to address latent civilian reintegration issues related to employment uniquely experienced by NG service members, namely job concerns regarding leaving and returning to

civilian employment. In addition, we've shown that employment-related strains and stressors are associated with the development of post-deployment mental health symptoms; job stress and poor coworker support contribute to symptoms of depression in NG veterans over two years after returning from Iraq. In addition, job stress may also contribute to an increase in symptoms of PTSD in some NG veterans not already experiencing symptoms in the early post-deployment time period. Overall, this research provides insights that have important implications for research and practice in this special population of veterans.

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Chapter 1: Specific Aims

Civilian reintegration is the process of military personnel transitioning back into personal and organizational roles and society following deployment. The body of literature on reintegration is limited but growing as the current conflicts continue in the Middle East. As service members return home, our newest generation of veterans from Iraq (Operation Iraqi Freedom; OIF and Operation New Dawn; OND) and Afghanistan (Operation Enduring Freedom; OEF) are faced with the task of reintegrating into potentially disrupted family, social, and occupational roles (Sayer et al. 2010; Milliken et al. 2007; Seal et al. 2009).

Depending on individual circumstances, the period of reintegration can be a difficult time for many returning service members. In a national survey conducted in 2008 of OEF/OIF combat veterans who had used Department of Veterans Affairs (VA) medical services, 40% reported some to extreme overall difficulty in readjusting to civilian life across a number of domains including social functioning, productivity, community involvement, and self-care (Sayer et al. 2010). Civilian reintegration may be particularly challenging for National Guard and Reserve (NGR) component service members. Unlike regular active duty (AD) component service members, NGR troops are typically leaving civilian roles (family and employment) and are more likely to deploy with unfamiliar units (Griffith 2011). Older NGR service members are likely well established in civilian occupations prior to deploying (Seal et al. 2009). Following deployment, NGR troops face unique reintegration challenges as they transition from warfighter back to civilian roles.

Post-deployment mental health problems (i.e., post-traumatic stress disorder; PTSD, depression, and alcohol or drug problems) may complicate the reintegration process. Military personnel returning from combat deployments in Iraq and Afghanistan are at increased risk of mental health problems (U.S. Army Surgeon General 2005; Hotopf et al. 2006; Browne et al. 2007; Milliken et al. 2007; Smith et al. 2008; Seal et al. 2009; Iverson et al. 2009). The heightened risk of mental health problems among veterans appears to increase in the months and years following combat deployment suggesting that experiences outside of deployment itself contribute to risk (Wolfe et al. 1999; Milliken et al. 2007; Seal et al. 2009). In addition, several reports indicate that risk is greater in NGR troops compared with regular AD troops (Hotopf et al. 2006; Browne et al. 2007; Milliken et al. 2007).

For NGR troops whose military service is relatively part-time and who retain commitments to civilian jobs, despite involvement in protracted or multiple deployments, a key feature of reintegration is the transition away from and back to civilian employment. For these veterans, we hypothesize that the strains and stressors experienced during this transition are associated with the development of post-deployment mental health symptoms and problems. Therefore, the specific aims of this research are to:

Specific Aims

1. Estimate the associations between pre- and post-deployment civilian job concerns and post-deployment symptoms of PTSD and depression in a sample of National Guard veterans (Paper 1).

2. Determine whether a post-deployment civilian job change affects post-deployment symptoms of PTSD and depression in a sample of National Guard veterans (Paper 1).

3. Estimate the associations between post-deployment civilian job stress and job support and post-deployment symptoms of PTSD and depression in a sample of National Guard veterans (Paper 2).

This dissertation research will contribute new knowledge that will aid in the development of evidence-based, recovery-oriented interventions for returning OIF/OND personnel. It will provide unique information on the transition to civilian employment and the effects of the post-deployment work environment on symptoms of mental health problems in a high risk group of veterans - service members of the National Guard. The findings will inform the development of targeted interventions for the prevention and treatment of PTSD and depression.

Chapter 2: Statement of Purpose and Background

The wars in Iraq and Afghanistan represent the longest sustained military operations since the Vietnam era. By the end of 2010, more than 2.2 million U.S. service members had deployed to Iraq (Operation Iraqi Freedom; OIF and Operation New Dawn; OND) and Afghanistan (Operation Enduring Freedom; OEF) since September 11, 2001. Unique to the current conflicts are military personnel serving in longer, and often multiple, deployments with shorter intervals at home between missions. In addition, these extended military operations have involved more women, parents of young children, and National Guard and Reserve (NGR) troops than in previous conflicts. NGR troops represent one-third of all troops deployed to Iraq and Afghanistan. These unique features of the current conflicts have important implications for the process of civilian reintegration, which will be further explored in the proposed research.

Civilian Reintegration in OEF/OIF/OND Veterans

Civilian reintegration is the process of military personnel transitioning back into personal and organizational roles and society following deployment. The body of literature on reintegration is limited but growing as the current conflicts continue in the Middle East. As service members return home, our newest generation of veterans from Iraq (OIF/OND) and Afghanistan (OEF) are faced with the task of reintegrating into potentially disrupted family, social, and occupational roles (Sayer et al. 2010; Milliken et al. 2007; Seal et al. 2009).

Depending on individual circumstances, the period of reintegration can be a difficult time for many returning service members. In a national survey conducted in

2008 of OEF/OIF combat veterans who had used Department of Veterans Affairs (VA) medical services, 40% reported some to extreme overall difficulty in readjusting to civilian life across a number of domains including social functioning, productivity, community involvement, and self-care (Sayer et al. 2010). Civilian reintegration may be particularly challenging for National Guard and Reserve (NGR) component service members. Unlike regular active duty (AD) component service members, NGR troops are typically leaving civilian roles (family and employment) and are more likely to deploy with unfamiliar units (Griffith 2011). Older NGR service members are likely well established in civilian occupations prior to deploying (Seal et al. 2009). Following deployment, NGR troops face unique reintegration challenges as they transition from warfighter back to civilian roles.

Mental Health Problems in OEF/OIF/OND Veterans

Post-deployment mental health problems (i.e., post-traumatic stress disorder or PTSD, depression, and alcohol or drug problems) may complicate the reintegration process. Military personnel returning from combat deployments in Iraq and Afghanistan are at increased risk of mental health problems compared to their peers who do not deploy or who deploy but are not exposed to combat (U.S. Army Surgeon General 2005; Hotopf et al. 2006; Browne et al. 2007; Milliken et al. 2007; Smith et al. 2008; Seal et al. 2009; Iverson et al. 2009). The heightened risk of mental health problems among veterans appears to increase even more in the months and years following combat deployment suggesting that experiences outside of deployment itself contribute to risk (Wolfe et al. 1999; Milliken et al. 2007; Seal et al. 2009). In a study examining trends

and risk factors for mental health diagnoses among 289,328 OEF/OIF veterans entering Veterans Affairs (VA) health care from 2002 to 2008, Seal et al. (2009) found the prevalence of mental health diagnoses increased linearly with increasing length of time in the VA health care system from one to four years. In addition, several reports indicate that risk is greater in NGR troops compared with regular AD troops (Hotopf et al. 2006; Browne et al. 2007; Milliken et al. 2007). For example, Milliken and colleagues (2007) found positive screening rates for PTSD and depression more than doubled among NGR service members from an immediate post-deployment screening to a re-evaluation six months later, from 12.7% to 24.5% for PTSD and from 3.8% to 13% for depression. This was in contrast to much smaller increases for regular AD service members during the same time-frame, from 11.8% to 16.7% for PTSD and from 4.7% to 10.3% for depression (Milliken et al. 2007).

Post-traumatic Stress Disorder (PTSD)

PTSD is a psychiatric disorder that can develop after direct, personal experience or witnessing of an event that poses a perceived threat of death or serious injury. It is one of the disorders most commonly diagnosed in U.S. combat troops deployed to Iraq and Afghanistan with an estimated prevalence of 5-20% in OEF/OIF veterans. There is a higher prevalence (> 30%) in service members who experience combat exposure and are wounded. Symptoms of PTSD include re-experiencing traumatic events through flashbacks and nightmares, avoidance of things associated with trauma, and hyperarousal. PTSD can cause substantial distress and functional impairment and can interfere with readjustment into one's previous life. The prevalence of PTSD (and depression) increases

with time after deployment in the readjustment period (Milliken et al. 2007; Seal et al. 2009).

Depression

PTSD is often comorbid with other psychiatric conditions (i.e., anxiety and depression) and substance use disorders. Accordingly, depression is the second-most common mental health diagnosis in U.S. combat troops deployed to Iraq and Afghanistan. The prevalence of depression in the Millenium Cohort Study (30,000 men; 10,000 women) in deployed service members who were exposed to combat in Iraq and Afghanistan was 5.7% in men and 15.7% in women (Wells et al. 2010). Symptoms of depression include persistent feelings of sadness, changes in appetite and/or sleeping patterns, loss of interest in activities, fatigue, inability to concentrate, and hopelessness or suicidal thoughts. Depression is a major contributor to health dissatisfaction and to mental health and physical health outcomes.

Effects of Mental Health Problems on Civilian Employment in Veterans

For NGR troops whose military service is relatively part-time and who retain commitments to civilian jobs, despite involvement in protracted or multiple deployments, a key feature of the reintegration process is the transition back to civilian employment. For veterans with diagnosed mental health problems, the effects of mental health problems on employment status and/or occupational functioning have been established first in Vietnam-era veterans, and more recently in OEF/OIF veterans as they reintegrate. For Vietnam-era veterans, Savoca and Rosenheck (2000) found that a lifetime diagnosis of PTSD was associated with a nearly 50% lower probability of current employment

more than 20 years after the end of the Vietnam War. Effects on employment rates were nearly as large for major depression and anxiety disorders. PTSD and depression were also associated with large decreases in hourly wage rates, 16% and 45%, respectively, in Vietnam-era veterans. In another study of 325 Vietnam-era veterans receiving treatment for PTSD, veterans with more severe PTSD symptoms were more likely to work part-time or not at all compared with veterans with less severe symptoms (Smith et al. 2005). Two recent studies using samples of OEF/OIF veterans have similarly found associations between mental health problems and occupational functioning (Adler et al. 2011; Erbes et al. 2011). In a cross-sectional analysis of 473 employed OEF/OIF veterans from six VA medical centers who were referred for psychiatric assessment, Adler et al. (2011) found significant work impairment across a number of domains on the Work Limitations Questionnaire (WLQ), such as mental-interpersonal demands, time management, and output. Work impairment was associated with major depressive disorder, PTSD, generalized anxiety or panic disorder, alcohol dependence, and illicit drug use. Erbes et al. (2011), utilizing a sample of 262 NGR service members deployed to OIF, found no association between presence of mental health problems and employment status, but did find lower levels of work role functioning in veterans with diagnoses of PTSD, depression, and/or alcohol abuse or dependence, and greater rates of deterioration over time in functioning in service members with a diagnosis of PTSD. Clearly where mental health problems exist, they impact a veteran's ability to work and function optimally upon reintegration.

Transition to Civilian Employment and Effects on Mental Health Problems

However, for a number of combat veterans, mental health problems do not develop for several months or years following deployment (Wolfe et al. 1999; Milliken et al. 2007; Seal et al. 2009). Riviere et al. (2011) published the first study specifically designed to address whether issues salient to OEF/OIF NG veterans were risk factors for developing PTSD and depression post-deployment. Utilizing a cross-sectional design, they examined the role of four NG-specific variables on PTSD and depression at three and 12 months post-deployment adjusting for demographic variables and combat exposure. A sample of over 4,000 NG soldiers from two brigades was surveyed at the two time points following their first deployment to Iraq; different soldiers were surveyed at each time point. The NG-specific variables included: self-reported financial hardship, job loss, employer support for military affiliation, and a variable indicating whether or not veterans believed their deployment had negatively affected coworkers at their civilian jobs in their absence. Results from the multivariate analyses indicated that all of the variables were associated with one or both of the mental health outcomes evaluated at one or both of the time points. These NG-specific variables were found to be risk factors for developing mental health problems conferring additional risk beyond combat exposure.

Consistent with the findings of Riviere et al. (2011), we believe there are civilian reintegration issues related to employment uniquely experienced by NGR service members that may be particularly important risk factors in the development of post-deployment mental health symptoms and problems. This dissertation research will examine a number of employment-related issues, including pre- and post-deployment

civilian job concerns, post-deployment civilian job change, and the effects of post-deployment job stress and job support on the development of post-deployment mental health symptoms and problems in a high risk group of veterans, service members of the National Guard.

Pearlin's Theory of Stress

The theory underlying this research is Pearlin's theory of stress (Pearlin 1989). According to this theory of stress (Pearlin 1989), life events (i.e., deployment, combat exposure, and post-deployment job change) and chronic strains (i.e., pre- and post-deployment concerns about job opportunities, promotion, and coworker relationships; employment factors such as job stress and poor supervisor and/or coworker relationships) converge in the lives of returning veterans to create stressful life conditions which subsequently can result in the development of post-deployment mental health problems. Chronic strains and stressors, as opposed to acute, life-threatening events (i.e., combat exposure), are ongoing and may gradually erode individuals' coping resources taxing their mental health. According to Miller and Rasmussen (2010), these effects likely continue being felt with the passing of time.

Job Concerns and Job Change

For the purposes of this research, specific job concern items were taken from a larger scale, the Concerns about Life and Family Disruptions scale from the Deployment Risk and Resilience Inventory (DRRI) (King et al. 2006; Vogt et al. 2008), which assesses how deployment might, or did, affect one's life and family. Prior work in a sample of NG troops utilizing the full scale indicated that prior to deployment having

more concerns about how deployment might negatively impact one's life and family predicted poorer pre-deployment mental health (Carter-Visscher et al. 2010), but the job concern items from this scale have not been assessed alone. These items include missing out on opportunities to start a career or on a promotion, damaging one's career, losing touch with co-workers or supervisors, and being unable to financially support one's family.

A job change, whether voluntary or involuntary, can be considered a significant life event. Other significant life events include (but are not limited to) marriage, birth of a child, divorce, loss of a loved one, and, of course, in the context of military populations, deployment and exposure to combat. Many of these significant life events have short- or long-term effects on future behavior and well-being (Sharpley et al. 2004). There is now a large body of literature demonstrating a relationship between life events and health, an idea which originated with Selye's definition of stress-reactivity (Selye 1956). According to his definition, significant life events cause unusual levels of arousal in the body which may become precursors of anxiety, depression, and physical ill-health simply because of the arousal itself. Based on this definition, it does not matter if the events are perceived as positive or negative because both types of events cause arousal and the associated psychophysiological consequences of arousal. While much of the subsequent research in this area has focused on the impact of negative life events in the development of mental health problems (Wichers et al. 2012), in the context of the current research, we posit that Selye's definition of stress-reactivity is applicable and that a post-deployment change in

employment, even if voluntary and perceived as desirable, would have a negative effect on mental well-being.

Job Stress and Job Support

For this research, job stress is defined as the perceived harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources, and needs of the worker. Job support is defined as the extent to which employees perceive their supervisors and fellow co-workers value their contributions and care about their well-being. The literature supports the role of stressful life events and low social support in the development of both PTSD and depression. We conceptualize job stress and job support as more specific domains of the broader constructs of stressful life events and social support, respectively, which have special salience for NG service members. Low social support and stressful life events were among the risk factors identified in a comprehensive model of major depression in men (Kendler et al. 2006). Likewise, in a meta-analysis of risk factors for PTSD in trauma-exposed adults, lack of social support and higher levels of life stress were identified as important risk factors in civilian and military populations, with life stress relatively more important in the civilian population (Brewin et al. 2000). These factors operating after trauma exposure had a somewhat stronger effect on PTSD than pre-trauma factors. Most recently, prior research in the sample of NG service members utilized for this research, Polusny et al. (2011) found that lack of post-deployment social support and experiencing a greater number of recent, stressful life events were both associated with new-onset

PTSD after controlling for combat exposure, findings consistent with other studies in military populations (Benotsch et al. 2000; Browne et al. 2007).

Limitations to Previous Research

As described above, Riviere et al. (2011) published the first cross-sectional study that examined factors specific to NG soldiers who leave and then return to civilian employment and the role of these factors in the development of PTSD and depression post-deployment making it a notable contribution to the literature. Investigators found that PTSD was associated with all NG-specific variables, self-reported financial hardship, job loss, lack of employer support, and a negative effect of deployment absence on coworkers at one or both evaluation times, three and 12 months. Depression was associated with financial hardship, job loss, and lack of employer support at three and 12 months, but it was not associated with an effect of deployment absence on co-workers. The primary limitation of this study was the lack of a longitudinal design which did not allow investigators to assess whether PTSD or depression preceded or were consequences of the NG-specific stressors.

Contribution of this Dissertation to Previous Research

This dissertation research will extend upon the work of Riviere et al. (2011) by examining factors specific to NG soldiers who leave and then return to civilian employment, and the role of these factors in the development of PTSD and depression post-deployment, utilizing a longitudinal study design. This design will allow us to overcome the limitations of previous work and enable us to assess whether PTSD or depression preceded or were consequences of the NG-specific stressors. This approach

will contribute new knowledge that will aid in the development of evidence-based, recovery-oriented interventions for returning OIF personnel.

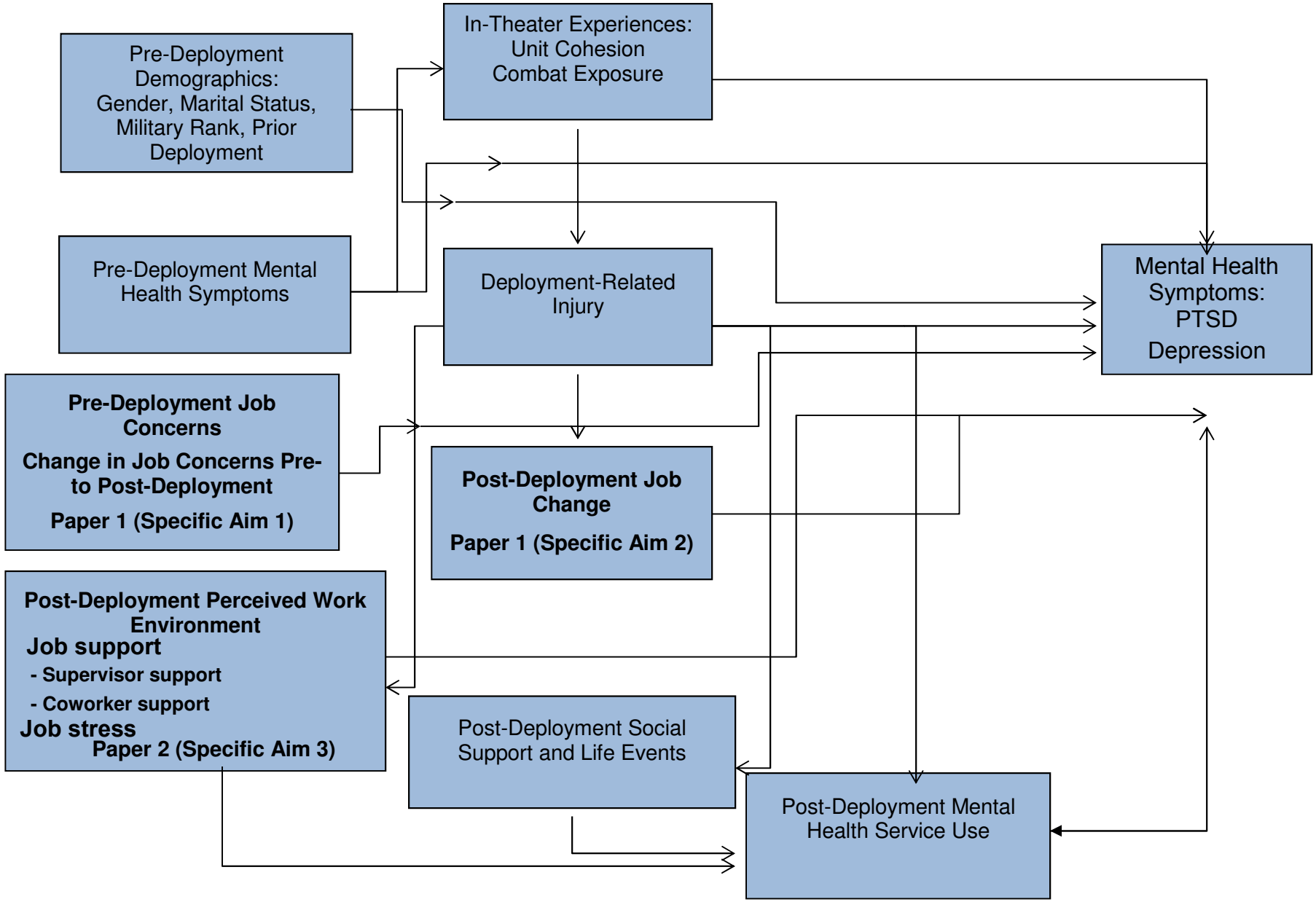

Figure 1- Conceptual Model

Chapter 3: Research Design and Methods

Specific Aims

The conceptual model for this dissertation is shown in Figure 1, and it distinguishes the focus of two manuscripts which are the products of the research and included as chapters 4 and 5, respectively, of the dissertation. Paper 1 will address Specific Aim 1, estimation of the associations between pre- and post-deployment civilian job concerns and post-deployment mental health symptoms of PTSD and depression, and Specific Aim 2, determination of whether a post-deployment civilian job change affects these same post-deployment mental health symptoms. Paper 2 will address Specific Aim 3, estimation of the associations between post-deployment civilian job stress and job support and post-deployment symptoms of PTSD and depression.

Overview

The data for this study were gathered as part of the Readiness and Resilience in National Guard Soldiers (RINGS) study, a study of risk and protective factors associated with post-deployment functioning. The study was a 4-wave longitudinal study designed to examine the effects of pre-deployment, deployment, and post-deployment risk and resiliency factors on subsequent mental health outcomes, mental health service utilization, and military retention/attrition (see Figure 2). In order to accomplish the specific aims of the dissertation research, explicitly Specific Aims 2 and 3, a smaller occupational cohort was assembled and additional data from this subgroup was collected (see Figure 3).

Study Population and Sample

The initial sample for the RINGS study was a voluntary, convenience sample of 522 Army NG soldiers (462 men and 60 women) from a single Brigade Combat Team (BCT) from Minnesota who provided pre-deployment data one month prior to the troops' deployment to Iraq. This sample represented approximately 20% of the population of 2,600 troops deployed from the BCT and was representative of the entire brigade with the exception of education levels (see Table 1). In March 2006, questionnaires assessing psychosocial risk/protective factors and baseline psychiatric symptoms were collected one month prior to troops' deployment to Iraq. Troops were informed about the study through flyers as well as announcements by mid-level leadership. Although no specific time for participation was allotted in troops' intense pre-deployment training schedule, 20% of the total BCT force met with investigators for a group briefing and received information about the study. Subsequently, participants completed questionnaires in group classrooms under standardized conditions. Troops had just completed five months of intensive mobilization training at Camp Shelby, Mississippi, and were poised for a 1-year deployment, which was later extended by 4 months. The BCT was deployed to Iraq from late March 2006 to July 2007.

Data Collection

Pre-deployment data was collected in a cohort of 522 National Guard soldiers from a Brigade Combat Team one month prior to deployment to Iraq (Time 1). Troops were deployed from March 2006 to July 2007. Post-deployment data was collected by mailed self-report questionnaires 2-3 months after the brigade returned from deployment (Time 2) and again approximately one and two years later (Times 3 and 4, respectively).

As illustrated in Figure 2, a total of 424 veterans (81% of the original cohort) completed Time 2 questionnaires. Subsequently, 343 veterans (66%) completed Time 3 questionnaires and 296 veterans (57%) completed Time 4 questionnaires.

Unique to Specific Aims 2 and 3, a smaller occupational cohort was assembled (see Figure 3); the occupational cohort completed two additional interviews following completion of the Time 2 and Time 3 mailed questionnaires to test the hypotheses regarding the potential impact of job change on mental health symptoms and the impact of post-deployment job stress and job support on mental health symptoms. This cohort responded to questions concerning pre-deployment work history and post-deployment occupational status and functioning. A total of 355 veterans completed a Time 2 supplemental interview in-person that gathered information on pre-deployment work history and current occupational status. Of those, 297 (response rate = 84%) completed a second supplemental interview on occupational functioning by telephone after completing the mailed questionnaire at Time 3, and 208 (59%) completed the final mailed questionnaire at Time 4. Job change, job stress, and job support were assessed at the Time 3 supplemental telephone interviews. Participants included in the dataset for Specific Aim 2, the job change analysis, were those who completed all four waves of self-report questionnaires (Times 1 through 4), the occupationally-focused supplemental interviews at Times 2 and 3, and responded to the item concerning change in employment (n = 164). Participants included in the dataset for Specific Aim 3, the job stress and job support analyses, were those who completed all four waves of self-report questionnaires (Times 1 through 4), occupationally-focused supplemental interviews at Times 2 and 3, and who were employed at Time 3 (n = 169).

Measures

Both papers estimated models with the same dependent variables, PTSD as assessed with the PTSD Checklist – Military Version (PCL-M), and depression, as assessed with the Beck Depression Inventory-II (BDI-II). The PCL-M is a 17-item self-report scale that assesses each of the symptoms of PTSD experienced in the past month using a Likert-type response format from 1 to 5 as they relate to a participant's military experiences. The PCL-M is widely used in military population studies and has high overall convergent validity and test-retest reliability. The PCL-M correlates highly with other interview and self-report measures of PTSD (Blanchard et al. 1996). The BDI-II is a 21-item self-report measure of the severity of depression symptoms. The BDI-II is widely used in both clinical and non-clinical populations, and has established internal consistency and test-retest reliability (Dozois et al. 1998). Participants completed the PCL-M and BDI-II at Times 1-4.

The exposures of interest varied by paper and are described in detail in chapters 4 and 5; the hypothesized causal models are shown in Figures 4 and 5. Definitions of Causal Model Variables are shown in Tables 2 and 3, which correspond with Figures 4 and 5, respectively.

The primary exposures of interest for Specific Aim 1, paper 1, included job/career concerns assessed both pre- and post-deployment, and change in employment from pre- to post-deployment. Selection of additional covariates to include in multivariate models was based on causal diagrams developed based on previous research and expert knowledge (see Figure 4). For Specific Aim 1, the job concerns analyses, the following covariates were included: gender, marital status, military rank, an indicator variable for having an OEF/OIF deployment prior to the 2006 deployment, continuous measures of PTSD symptoms and depression symptoms, measures of combat exposure and unit cohesion during deployment, mental health services use

since returning home from deployment, and measures of post-deployment social support and stressful life events. We hypothesize that NG veterans who experience greater job concerns prior to deploying to Iraq will have more symptoms of PTSD and depression immediately upon return, and at one and two years post-deployment compared to their peers who experience less concerns prior to deployment. Next, we hypothesize that NG veterans who experience an increase in job concerns from pre- to post-deployment will have more symptoms of PTSD and depression immediately upon return, and at one and two years post-deployment compared to their peers who experience no change or a decrease in concerns. Testing these two hypotheses, we will be able to accomplish Specific Aim 1, to estimate the associations between pre- and post-deployment civilian job concerns and post-deployment symptoms of PTSD and depression in a sample of National Guard veterans.

The primary exposures of interest for Specific Aim 2, paper 1, included a change in civilian employment, or returning to a different job post-deployment. For the job change analyses, the following covariates were included: gender, military rank, an indicator variable for having an OEF/OIF deployment prior to the 2006 deployment, a measure of combat exposure during deployment, a variable indicating whether or not any injuries were experienced during deployment, and a variable indicating whether or not a veteran was also in school at Time 3. In addition, the pre-deployment job/career concerns variable and the pre- to post-deployment job/career concerns change variable were included in the models. We hypothesize that NG veterans who return to a different job post-deployment (i.e., experience a job change) will have more symptoms of PTSD and depression at one and two years post-deployment compared to their peers who return to the same job post-deployment. Testing this hypothesis will enable us to

accomplish Specific Aim 2, to determine whether a post-deployment civilian job change affects post-deployment symptoms of PTSD and depression in a sample of National Guard veterans.

The primary exposures of interest for Specific Aim 3, paper 2, included post-deployment civilian perceived job stress and job support. The following covariates were included: gender, military rank, an indicator variable for having an OEF/OIF deployment prior to the 2006 deployment, a variable indicating whether or not any injuries were experienced during deployment, measures of combat exposure and unit cohesion during deployment, continuous measures of PTSD symptoms and depression symptoms (Time 2), Time 3 report of mental health services use since returning home from deployment, and measures of post-deployment social support and stressful life events at Time 3. We hypothesize, after accounting for other important deployment-related and post-deployment variables (including social support and stressful life events), that job support and job stress will be uniquely associated with symptoms of PTSD and depression at two years post-deployment. Testing this hypothesis will enable us to accomplish Specific Aim 3, to estimate the associations between post-deployment civilian job stress and job support and post-deployment symptoms of PTSD and depression in a sample of National Guard veterans.

Analyses

This research evaluates the transition away from and back to civilian employment and seeks to identify strains and stressors that are associated with the development of post-deployment mental health symptoms in a high risk group of veterans. As such, the goal of the data analyses was to estimate a number of associations between job-related exposures and post-deployment mental health symptoms, controlling for important confounding factors (or covariates), using comprehensive causal models. These models, eventually in the form of

directed acyclic graphs, served as the basis for all analyses and interpretation. Typical methods for deciding whether or not a variable is a confounder rely mostly on statistical criteria, which can lead to bias from the omission of important confounders or inappropriate adjustment for non-confounders. DAGs incorporate a priori causal knowledge and can serve as an aid for identifying variables that must be measured and controlled to obtain unconfounded effect estimates. They lead users to a minimum set of confounders by including only those variables with direct causal effects on both exposure and outcome (Greenland et al. 1999). Descriptive statistics and univariate analyses were performed, first, to describe the characteristics of individual exposures. Next, in addressing Specific Aim 1, correlations were used to look at bivariate associations between job concerns and post-deployment mental health symptoms. Subsequently, based on the causal models in addressing all aims, variables were selected to enter the multivariate models as covariates. Linear regression analyses and "differences-in-differences" (DD) methodologies were utilized to address Specific Aims 1-3 as described further below.

For Specific Aim 1 (job concerns analyses) and Specific Aim 3 (job stress and job support analyses), linear regression was used investigate the relation between specific exposures and our continuous measures of post-deployment mental health symptoms. Regression is used to study relationships between measurable variables. Linear regression is used for a special class of relationships – those that can be described by straight lines. In the case of our research, multiple linear regression was used to quantify the strength of the relationship between post-deployment mental health symptoms and our job-related exposures, controlling for important confounding factors (or covariates). In each analysis, the model was specified by a linear equation,

$$\text{MH Symptoms} = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_p X_p + \mu_p$$

where α and the β's are the model coefficients (unknown parameters) estimated from the data, $X_1, X_2, \ldots X_p$ are the values for our job-related exposures and other covariates (predictor variables) included in any

given model, and μ_p is the error term. The error term captures other factors that influence our dependent variable other than the regressors (X_p) included in the model.

For Specific Aim 2 (the job change analyses), a "differences-in-differences" (DD) methodology was employed. Since this is an observational study and we can't randomize veterans to return to the same job post-deployment, we were concerned with the endogenous nature of the job change hypothesis. Specifically, we were concerned that there were unobserved variables that affect whether or not a veteran returned to the same job post-deployment that may also affect having symptoms of PTSD or depression post-deployment. To address this potential source of omitted variable bias, the DD methodology was utilized. This approach controls for unobserved sources of variability in our dependent variable (mental health symptoms) by using repeated observations from the pre- and post-deployment time periods, and identifying two groups of veterans, an experimental and control group, who differ in their return to a job post-deployment. This approach is designed to capture unobserved differences between the groups that might be correlated with post-deployment mental health symptoms.

To illustrate the approach, consider the following matrix of mental health symptoms:

	Deployment to Iraq	
Impact of Not Returning to Same Job	Pre-Deployment	Post-Deployment
Control Group – Same Job	MH00	MH01
Experimental Group – Different Job	MH10	MH11

In order to assess the impact of not returning to the same job post-deployment, one can look at the experimental group's mental health symptoms pre- and post-deployment, and compute the difference (MH11 - MH10). However, this approach ignores the fact that some of the hypothesized increase in mental health symptoms post-deployment may be due to unobserved variables such as the economic downturn that veterans returned to, as well as other changes in veterans' demographic and socio-economic conditions from the pre- to post-

deployment time periods. Although one can control for these demographic and socio-economic conditions in a multivariate regression model, the advantage of the DD approach is that the veterans who returned to the same job post-deployment can be used as a control group for other time invariant unobserved differences not included in the model. Thus, the difference (MH01 - MH00) reflects the impact of any unobserved variables. Computing the difference in these differences, (MH11 - MH10) - (MH01 - MH00), yields a measure of the pure effect of not returning to the same job post-deployment on mental health symptoms.

To address our study hypothesis, the DD specification included dichotomous (0/1) variables to account for 1) whether or not it was the pre-deployment vs. the post-deployment time period, 2) whether or not a veteran returned to a different job post-deployment, and 3) the interaction between these two dichotomous variables. The interaction term between the two dichotomous variables captured the effect of returning to a different job on mental health symptoms for the experimental group vs. control group and was the coefficient of interest.

Bias Evaluation

As noted above, the DD methodology was utilized to address the potential source of omitted variable bias in the job change analyses. In addition, there was some evidence in addressing Specific Aim 2 (job change analyses) of selective attrition from the sample. That is, non-responders at Times 3 and 4 tended to have greater symptom severity scores for PTSD and depression in the previous time period than responders. In order to address this potential source of non-response bias in our analyses, additional analyses were conducted including the non-responders making assumptions regarding their job change status. We re-ran all the job change models under the assumption that all non-responders had changed jobs and again under the assumption that all non-responders had not changed jobs.

Human Subjects

All participants provided written informed consent to take part in the RINGS study. Study protocols were reviewed and approved by the Institutional Review Boards of the Minneapolis VA Health Care System, University of Minnesota, and the Department of Defense. Additional IRB approval was sought from the Minneapolis VA Health Care System to assemble and interview the occupational cohort and from the University of Minnesota to conduct the dissertation research.

Table 1. Representativeness of RINGS Cohort Sample

Variable	BCT from MN (n = 2,600)	Initial RINGS Sample (n = 522)
Gender		
Male	90.9%	88.5%
Female	9.1%	11.5%
Age		
20-29	65.0%	61.1%
30-39	24.4%	25.7%
40-49	9.2%	10.4%
50-59	1.4%	2.5%
Age Range	18-58	18-57
Education		
High school	74.0%	27.7%
Some college	8.6%	41.9%
College degree	17.4%	30.4%
Marital Status		
Single	54.7%	50.0%
Divorced	4.2%	4.9%
Married	41.1%	45.1%
Race/Ethnicity		
Caucasian	93.6%	92.7%
African-American	2.1%	2.3%
Native American	1.2%	0.9%
Asian	1.9%	1.5%
Latino	no similar category	2.1%
Rank		
Enlisted	89.5%	89.5%
Officer	9.6%	9.4%
Warrant	0.9%	0.6%

Figure 2. RINGS Study Design and Data Collection Waves

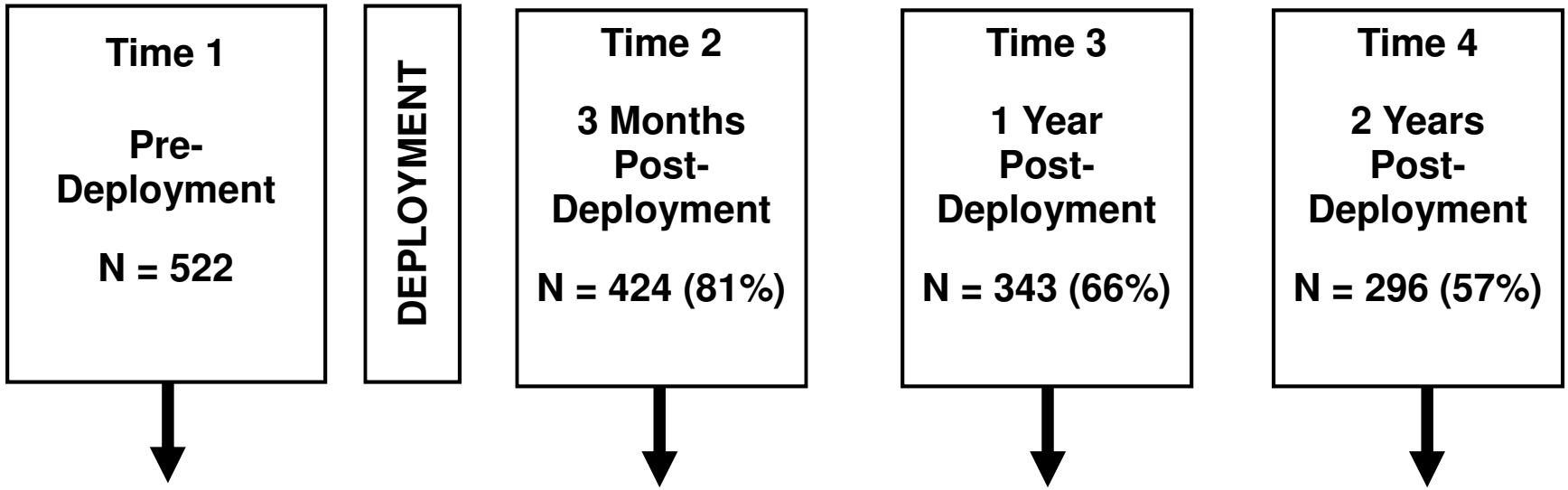

Figure 3. RINGS Study Design with Occupational Cohort

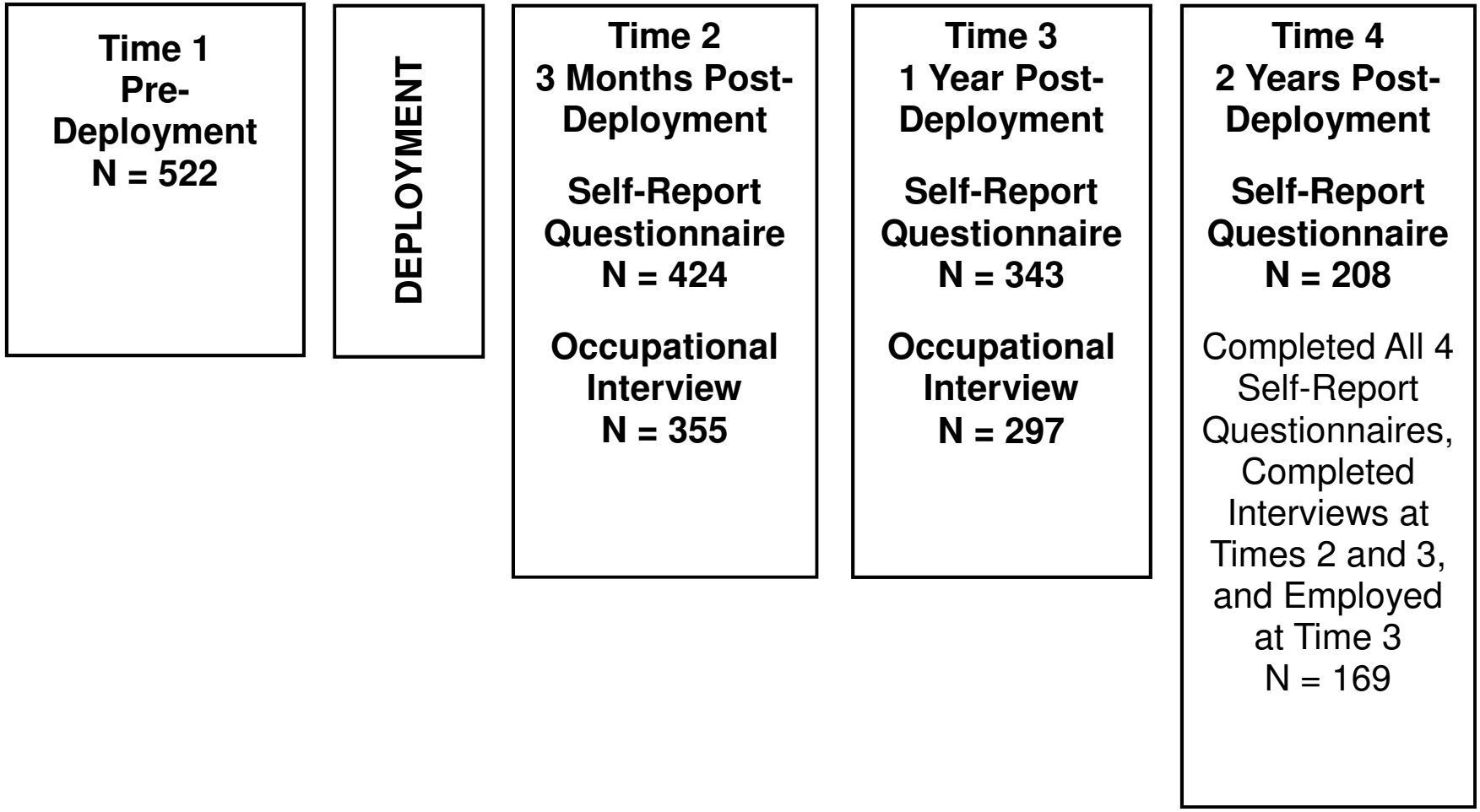

Table 2. Causal Model Variable Definitions Table for Paper 1

Variable Name	Variable Definition	Corresponding Questionnaire and Question(s)
Exposures of Interest		
Perceived Job Concerns	Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	National Guard Service Personnel Pre-Deployment Survey (Time 1): pg 9 Section D: Life and Family Concerns Q1-Q5
Change in Perceived Job Concerns	Change in Job Concerns (Time 2-Time 1)	National Guard Service Personnel Pre-Deployment Survey (Time 1): pg 9 Section D: Life and Family Concerns Q1-Q5; Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 2): pg 14 Life and Family Concerns Q1-Q5
Job Change	Veteran returned to a different job (vs. same job) immediately post-deployment	Time 3 Telephone Interview on Occupational Status/Functioning: Q7
Covariates		
Veteran Characteristics	Gender, marital status, military rank, prior OEF/OIF deployment	National Guard Service Personnel Pre-Deployment Survey (Time 1): pg 5 Demographic Form (Gender, Marital Status, What is your current rank?, Have you been previously deployed on a combat operation?, Where were you deployed?)
Deployment-Related Injury	Any deployment-related injury	Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 2): pg 11 Q 5, Q7, and Q8
In-Theater Support (Unit Cohesion)	Time 2 DRRI Unit Support Scale Score	Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 2): pg 25 Part A: Unit Characteristics Q1-Q12

In-Theater Combat Exposure	Time 2 DRRI Combat Experiences Scale Score	Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 2): pg 12 Combat Q1-Q16
Post-Deployment PTSD Symptoms	Time 1-Time 3 PCL-M Score	National Guard Service Personnel Pre-Deployment Survey (Time 1): pg 19-20 PCL Q1-Q17 Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 2): pg 21 Part A: Stress Reactions Q1-Q17; Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 3): pg 6 Section D: Current Mood Q1-Q17
Post-Deployment Depression Symptoms	Time 1-Time 3 BDI-II Score	National Guard Service Personnel Pre-Deployment Survey (Time 1): pg 21-23 BDI-II Q1-Q21 Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 2): pg 23-24 Part D: Mood Questions Q1-Q21; Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 3): pg 8-9 Section F: Mood Questions Q1-Q21
Post-Deployment Mental Health Service Use	Time 2-Time 4 Mental Health Service Use	Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 2): pg 20 Q3 Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 3): pg 5 Section C: Healthcare Use Q3 Readiness and Resilience in National

		Guard Soldiers (RINGS) Study Survey (Time 4): pg 4 Section C: Healthcare Use Q3
Post-Deployment Social Support	Time 2-Time 4 DRRI Social Support Scale Score	Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 2): pg 9 Part D: Post-Deployment Support Q1-Q15; Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 3): pg 2 Section A: Post-Deployment Support Q1-Q15; Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 4): pg 1 Section A: Post-Deployment Support Q1-Q15
Post-Deployment Stressors	Time 2-Time 4 DRRI Stressors Scale Score	Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 2): pg 17 Part C: Post-Deployment Life Events Q1-Q17; Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 3): pg 3Section B: Post-Deployment Life Events Q1-Q17; Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 4): pg 2Section B: Post-Deployment Life Events Q1-Q17
In School	In school and working at Time 3	Time 3 Telephone Interview on Occupational Status/Functioning: Q2
Outcomes		
Post-Deployment PTSD Symptoms	Time 2-Time 4 PCL-M Score	Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 2): pg 21 Part A: Stress Reactions

		Q1-Q17; Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 3): pg 6 Section D: Current Mood Q1-Q17; Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 4): pg 5 Section D: Current Mood Q1-Q17
Post-Deployment Depression Symptoms	Time 2-Time 4 BDI-II Score	Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 2): pg 23-24 Part D: Mood Questions Q1-Q21; Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 3): pg 8-9 Section F: Mood Questions Q1-Q21; Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 4): pg 7-8 Section F: Mood Questions Q1-Q21

Table 3. Causal Model Variable Definitions Table for Paper 2

Variable Name	Variable Definition	Corresponding Questionnaire and Question(s)
Exposures of Interest		
Perceived Job Stress	Harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources, and needs of the worker	Time 3 Telephone Interview on Occupational Status/Functioning: Q16 and Q17
Perceived Supervisor Support	Extent to which employees perceive their supervisors value their contributions and care about their well-being	Time 3 Telephone Interview on Occupational Status/Functioning: Q20
Perceived Coworker Support	Extent to which employees perceive their fellow co-workers value their contributions and care about their well-being	Time 3 Telephone Interview on Occupational Status/Functioning: Q19
Covariates		
Veteran Characteristics	Gender, military rank, prior OEF/OIF deployment	National Guard Service Personnel Pre-Deployment Survey (Time 1): pg 5 Demographic Form (Gender, What is your current rank?, Have you been previously deployed on a combat operation?, Where were you deployed?)
Deployment-Related Injury	Any deployment-related injury	Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 2): pg 11 Q 5, Q7, and Q8
In-Theater Support (Unit Cohesion)	Time 2 DRRI Unit Support Scale Score	Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 2): pg 25 Part A: Unit Characteristics Q1-Q12
In-Theater Combat Exposure	Time 2 DRRI Combat Experiences Scale Score	Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 2): pg 12 Combat Q1-Q16
Post-Deployment PTSD Symptoms	Time 2 PCL-M Score	Readiness and Resilience in National

		Guard Soldiers (RINGS) Study Survey (Time 2): pg 21 Part A: Stress Reactions Q1-Q17
Post-Deployment Depression Symptoms	Time 2 BDI-II Score	Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 2): pg 23-24 Part D: Mood Questions Q1-Q21
Post-Deployment Mental Health Service Use	Time 3 Mental Health Service Use	Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 3): pg 5 Section C: Healthcare Use Q3
Post-Deployment Social Support	Time 3 DRRI Social Support Scale Score	Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 3): pg 2 Section A: Post-Deployment Support Q1-Q15
Post-Deployment Stressors	Time 3 DRRI Stressors Scale Score	Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 3): pg 3Section B: Post-Deployment Life Events Q1-Q17
Outcomes		
Post-Deployment PTSD Symptoms	Time 3 or Time 4 PCL-M Score	Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 3): pg 6 Section D: Current Mood Q1-Q17; Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 4): pg 5 Section D: Current Mood Q1-Q17
Post-Deployment Depression Symptoms	Time 3 or Time 4 BDI-II Score	Readiness and Resilience in National Guard Soldiers (RINGS) Study Survey (Time 3): pg 8-9 Section F: Mood Questions Q1-Q21; Readiness and Resilience in National

		Guard Soldiers (RINGS) Study Survey (Time 4): pg 7-8 Section F: Mood Questions Q1-Q21

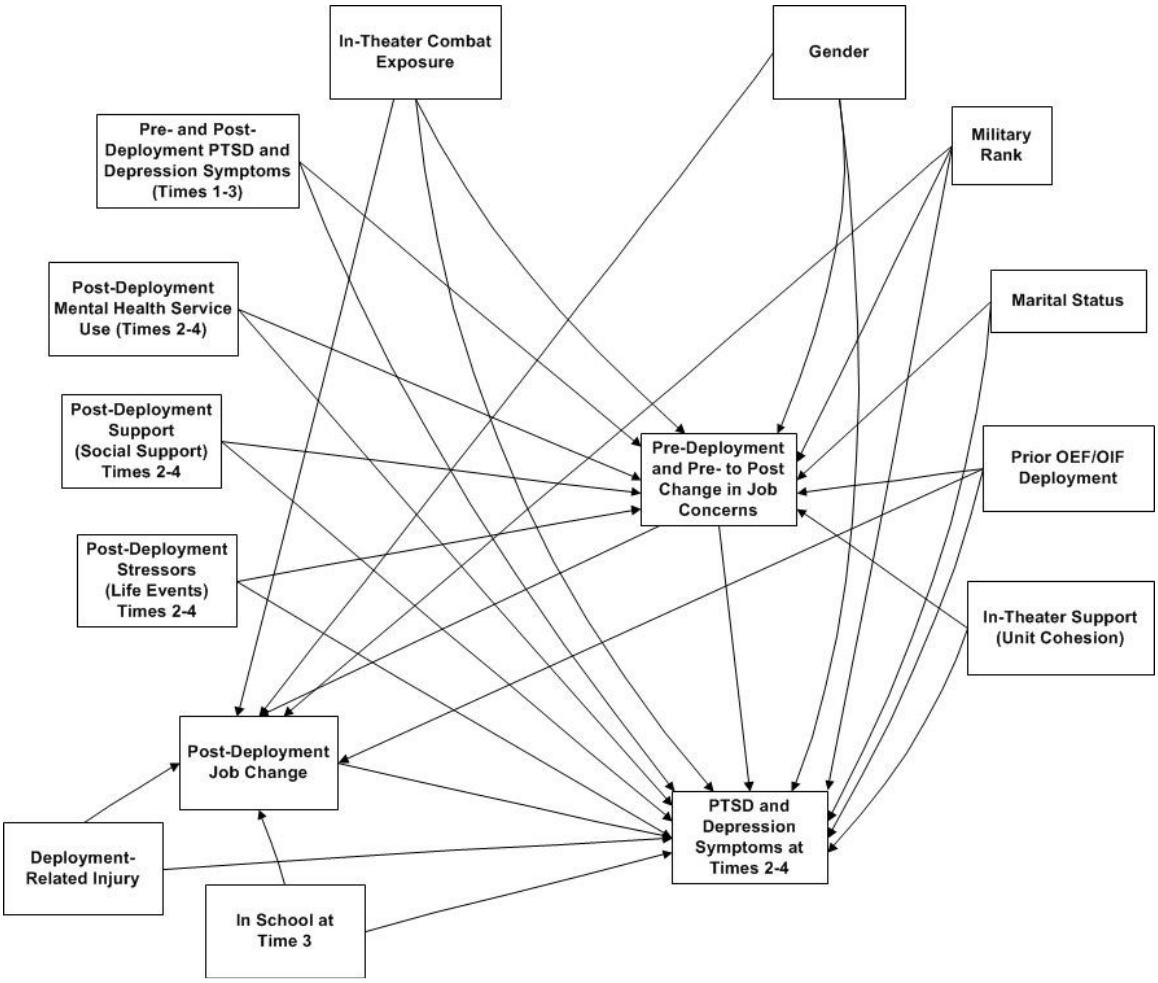

Figure 4. Causal model(s) used for multivariate modeling of PTSD and depression symptoms – exposures: job concerns and job change.

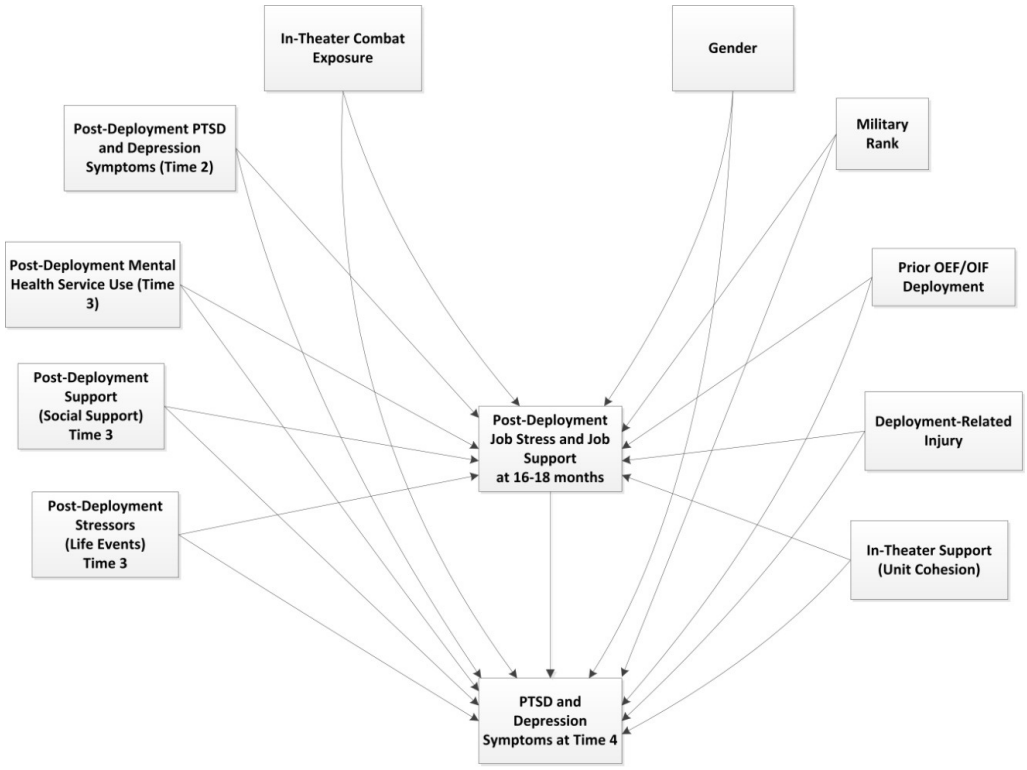

Figure 5. Causal model(s) used for multivariate modeling of PTSD and depression symptoms at Time 4 – exposures: job stress and job support.

Chapter 4: The effects of pre- and post-deployment job concerns and job change on mental health symptoms in National Guard veterans returning from Iraq

Objectives: A key feature of the civilian reintegration process for National Guard and Reserve (NGR) veterans is the transition away from and back to civilian employment. Issues related to employment, namely job concerns and changing jobs post-deployment, may be important risk factors in the development of post-deployment mental health symptoms. We hypothesized that NG veterans who experienced greater job concerns prior to deploying to Iraq would have more symptoms of PTSD and depression immediately upon return, and at one and two years post-deployment compared to their peers who experienced less concerns prior to deployment. Next, we hypothesized that NG veterans who experienced an increase in job concerns from pre- to post-deployment would have more symptoms of PTSD and depression immediately upon return, and at one and two years post-deployment compared to their peers who experienced no change or a decrease in concerns. Finally, we tested the hypothesis that NG veterans who returned to a different job post-deployment (i.e., experienced a job change) would have more symptoms of PTSD and depression at one and two years post-deployment compared to their peers who returned to the same job post-deployment.

Methods: We utilized prospective, longitudinal data from the Readiness and Resilience in National Guard Soldiers (RINGS) study, a study of risk and protective factors associated with post-deployment functioning. Pre-deployment data was collected in a cohort of 522 National Guard soldiers from a single brigade one month prior to deployment to Iraq (Time 1). Troops were deployed from March 2006 to July 2007. Post-deployment data was collected by mailed self-report questionnaires 2-3 months after brigade return (Time 2), and again approximately one and two years later (Times 3 and 4). A total of 424 veterans (81%) completed Time 2 questionnaires, 343 veterans (66%) completed Time 3 questionnaires, and 296 veterans (57%) completed Time 4 questionnaires. For the first set of analyses regarding job concerns, all respondents to the post-deployment mailed questionnaires were included for a given time period. A smaller occupational cohort completed two additional interviews following completion of the Time 2 and Time 3 mailed questionnaires; a total of 355 completed an interview after Time 2 that gathered information on pre-deployment work history and current occupational status. Of those, 297 (84%) completed a second interview on occupational functioning after completing the mailed questionnaire at Time 3, and 208 (59%) completed the final mailed questionnaire at Time 4. Job change was assessed at the Time 3 telephone interviews. Participants for the job change analysis were those who completed all four waves of self-report questionnaires (Times 1 through 4), occupationally-focused interviews at Times 2 and 3, and responded to the item concerning change in employment (n = 164). Linear regression models were employed to examine the effects of job concerns on post-deployment symptoms of PTSD and depression. A “differences-in-differences” model was used to determine whether a post-deployment civilian job change affects post-deployment symptoms of PTSD and depression.

Results: We found significant correlations and significance in multivariate models controlling for demographics and combat exposure between job concerns and symptoms of both depression and PTSD; this was particularly true when job concerns were assessed prior to deployment. Job change had no significant effect on symptoms of either PTSD or depression, in contrast to our hypotheses.

Conclusions: NGR veterans face unique challenges post-deployment as their military service is relatively part-time and they retain commitments to civilian jobs despite involvement in protracted or multiple deployments. We’ve identified the pre-deployment time period as a potential time to address latent civilian reintegration issues related to employment uniquely experienced by NG service members, namely job concerns regarding leaving and returning to civilian employment. Addressing such concerns in the context of pre-deployment resiliency

training could potentially alleviate concerns and promote resilience in this special population of veterans.

Introduction

Civilian reintegration is the process of military personnel transitioning back into personal and organizational roles and society following deployment. The body of literature on reintegration is limited but growing as the current conflicts continue in the Middle East. As service members return home, our newest generation of veterans from Iraq (Operation Iraqi Freedom; OIF and Operation New Dawn; OND) and Afghanistan (Operation Enduring Freedom; OEF) are faced with the task of reintegrating into potentially disrupted family, social, and occupational roles (Sayer et al. 2010; Milliken et al. 2007; Seal et al. 2009).

Depending on individual circumstances, the period of reintegration can be a difficult time for many returning service members. In a national survey conducted in 2008 of OEF/OIF combat veterans who had used Department of Veterans Affairs (VA) medical services, 40% reported some to extreme overall difficulty in readjusting to civilian life across a number of domains including social functioning, productivity, community involvement, and self-care (Sayer et al. 2010). Civilian reintegration may be particularly challenging for National Guard and Reserve (NGR) component service members. Unlike regular active duty (AD) component service members, NGR troops typically are leaving civilian roles (family and employment) and are more likely to deploy with unfamiliar units (Griffith 2011). Older NGR service members are likely well established in civilian occupations prior to deploying (Seal et al. 2009). Following deployment, NGR troops face unique reintegration challenges as they transition from warfighter back to civilian roles.

Post-deployment mental health problems (i.e., post-traumatic stress disorder; PTSD, depression, and alcohol or drug problems) may complicate the reintegration process. Military personnel returning from combat deployments in Iraq and Afghanistan are at increased risk of mental health problems (U.S. Army Surgeon General 2005; Hotopf et al. 2006; Browne et al. 2007; Milliken et al. 2007; Smith et al. 2008; Seal et al. 2009; Iverson et al. 2009). The heightened risk of mental health problems among veterans appears to increase even more in the months and years following combat deployment suggesting that experiences outside of deployment itself contribute to risk (Wolfe et al. 1999; Milliken et al. 2007; Seal et al. 2009). In a study examining trends and risk factors for mental health diagnoses among 289,328 OEF/OIF veterans entering Veterans Affairs (VA) health care from 2002 to 2008, Seal et al. (2009) found that the prevalence of mental health diagnoses increased linearly with increasing length of time in the VA health care system from one to four years. In addition, several reports indicate that risk is greater in NGR troops compared with regular AD troops (Hotopf et al. 2006; Browne et al. 2007; Milliken et al. 2007). Milliken and colleagues (2007) found positive screening rates for PTSD and depression more than doubled among NGR service members from an immediate post-deployment screening to a re-evaluation six months later, from 12.7% to 24.5% for PTSD and from 3.8% to 13% for depression. In contrast, much smaller increases for regular AD service members during the same time-frame, from 11.8% to 16.7% for PTSD and from 4.7% to 10.3% for depression (Milliken et al. 2007).

For NGR troops whose military service is relatively part-time and who retain commitments to civilian jobs, despite involvement in protracted or multiple deployments,

a key feature of reintegration is the transition away from and then back to civilian employment. For veterans with diagnosed post-deployment mental health problems, the effects of mental health problems on employment status and/or occupational functioning were first established in Vietnam-era veterans, and more recently in OEF/OIF veterans as they reintegrate. For Vietnam-era veterans, Savoca and Rosenheck (2000) found that a lifetime diagnosis of PTSD was associated with a nearly 50% lower probability of current employment more than 20 years after the end of the Vietnam War. Effects on employment rates were nearly as large for major depression and anxiety disorders. PTSD and depression were also associated with large decreases in hourly wage rates, 16% and 45%, respectively, in Vietnam-era veterans. In another study of 325 Vietnam-era veterans receiving treatment for PTSD, veterans with more severe PTSD symptoms were more likely to work part-time or not at all compared with veterans with less severe symptoms (Smith et al. 2005).

Two recent studies using samples of OEF/OIF veterans have similarly found associations between mental health problems and occupational functioning (Adler et al. 2011; Erbes et al. 2011). In a cross-sectional analysis of 473 employed OEF/OIF veterans from six VA medical centers who were referred for psychiatric assessment, Adler et al. (2011) found significant work impairment across a number of domains on the Work Limitations Questionnaire (WLQ). Work impairment was associated with major depressive disorder, PTSD, generalized anxiety or panic disorder, alcohol dependence, and illicit drug use. Erbes et al. (2011), utilizing a sample of 262 NGR service members deployed to OIF, found no association between presence of mental health problems and employment status, but did find lower levels of work role functioning in veterans with

diagnoses of PTSD, depression, and/or alcohol abuse or dependence, and greater rates of deterioration in functioning over time in service members with a diagnosis of PTSD. Clearly where mental health problems exist, they impact a veteran's ability to work and function optimally upon reintegration.

However, for a number of combat veterans, mental health problems do not develop for several months or years following deployment (Wolfe et al. 1999; Milliken et al. 2007; Seal et al. 2009). For some of these veterans, specifically NGR veterans, we hypothesize that the strains and stressors experienced during the transition away from and back to civilian life, specifically the transition away from and back to civilian employment, are associated with the development of post-deployment mental health symptoms and problems.

Riviere et al. (2011) published the first study specifically designed to address whether employment-related issues salient to OEF/OIF NGR veterans were risk factors for developing PTSD and depression post-deployment. Utilizing a cross-sectional design, they examined the role of four NG-specific variables on PTSD and depression at three and 12 months post-deployment adjusting for demographic variables and combat exposure. A sample of over 4,000 NG soldiers from two brigades was surveyed at the two time points following their first deployment to Iraq; different soldiers were surveyed at each time point. The NG-specific variables included: self-reported financial hardship, job loss, employer support for military affiliation, and a variable indicating whether or not veterans believed their deployment had negatively affected coworkers at their civilian jobs in their absence. Results from the multivariate analyses indicated that all of the variables were associated with one or both of the mental health outcomes evaluated at

one or both of the time points. These NG-specific variables were found to be risk factors for developing mental health problems conferring additional risk beyond combat exposure. A limitation of this study was the lack of a longitudinal design which did not allow them to assess whether depression or PTSD preceded or were consequences of the NG-specific stressors.

Like Riviere et al. (2011), we believe civilian reintegration issues related to employment uniquely experienced by NGR service members, namely job concerns regarding leaving and returning to civilian employment, may be particularly important risk factors in the development of post-deployment mental health symptoms and problems. For the purposes of our work, we assessed the impact of a number of job concerns NG service members were experiencing prior to deployment and upon return from Iraq on mental health symptoms. In addition, to extend upon this further, we examined how an actual change in jobs post-deployment affected the development of subsequent mental health symptoms and problems.

The theory underlying our analyses is Pearlin's theory of stress (Pearlin 1989). According to this theory of stress (Pearlin 1989), life events (i.e., deployment, combat exposure, and post-deployment job change) and chronic strains (i.e., pre- and post-deployment concerns about job opportunities, promotion, and coworker relationships) converge in the lives of returning veterans to create stressful life conditions which subsequently can result in the development of post-deployment mental health problems.

A change in employment, whether voluntary or involuntary, can be considered a significant life event. Other significant life events include (but are not limited to) marriage, birth of a child, divorce, loss of a loved one, and, of course, in the context of

military populations, deployment and exposure to combat. Many of these significant life events have short- or long-term effects on future behavior and well-being (Sharpley et al. 2004). There is now a large body of literature demonstrating a relationship between life events and health, an idea which originated with Selye's definition of stress-reactivity (Selye 1956). According to his definition, significant life events cause unusual levels of arousal in the body which may become precursors of anxiety, depression, and physical ill-health simply because of the arousal itself. Based on this definition, it does not matter if the events are perceived as positive or negative because both types of events cause arousal and the associated psychophysiological consequences of arousal. While much of the subsequent research in this area has focused on the impact of negative life events in the development of mental health problems (Kendler et al. 1999, 2001; Rijsdijk et al. 2001; Paykel, 2003; Hammen, 2005), in the context the current research study, we believed that Selye's definition of stress-reactivity would apply and that a post-deployment change in employment, even if voluntary and perceived as desirable, would have a negative effect on mental well-being.

Extending upon the work of Riviere et al. (2011) by examining NG-specific variables utilizing a longitudinal design, our goals were to examine the role of job concerns and job change in the development of symptoms of PTSD and depression in a cohort of NG service members who completed a 16-month deployment in Iraq. First, we hypothesized that NG veterans who experienced greater job concerns prior to deploying to Iraq would have more symptoms of PTSD and depression immediately upon return, and at one and two years post-deployment compared to their peers who experienced less concerns prior to deployment. Next, we hypothesized that NG veterans who experienced

an increase in job concerns from pre- to post-deployment would have more symptoms of PTSD and depression immediately upon return, and at one and two years post-deployment compared to their peers who experienced no change or a decrease in concerns. Finally, we tested the hypothesis that NG veterans who returned to a different job post-deployment (i.e., experienced a job change) would have more symptoms of PTSD and depression at one and two years post-deployment compared to their peers who returned to the same job post-deployment.

Methods

Data Collection

We utilized prospective, longitudinal data to examine job concerns and a change in civilian employment and their effects on post-deployment mental health symptoms in a cohort of NGR veterans. The data were gathered as part of the Readiness and Resilience in National Guard Soldiers (RINGS) study, a study of risk and protective factors associated with post-deployment functioning (see Polusny et al. 2011 for details). Pre-deployment data was collected in a cohort of 522 National Guard soldiers from a single brigade combat team one month prior to deployment to Iraq (Time 1). Troops were deployed from March 2006 to July 2007. Post-deployment data was collected by mailed self-report questionnaires 2-3 months after the brigade returned from deployment (Time 2), and again approximately one and two years later (Times 3 and 4).

For the first set of analyses regarding job concerns, all respondents to the post-deployment mailed questionnaires were included for a given time period. As illustrated in Figure 2 (see Chapter 3), a total of 424 veterans (81% of the original cohort) completed

Time 2 questionnaires. Subsequently, 343 veterans (66%) completed Time 3 questionnaires and 296 veterans (57%) completed Time 4 questionnaires.

To test the hypothesis regarding job change, a smaller occupational cohort was assembled; the occupational cohort completed two additional interviews following completion of the Time 2 and Time 3 mailed questionnaires. This cohort responded to questions concerning pre-deployment work history and post-deployment occupational status and functioning. A total of 355 veterans completed a Time 2 interview that gathered information on pre-deployment work history and current occupational status. Of those, 297 (response rate = 84%) completed a second interview on occupational functioning by telephone after completing the mailed questionnaire at Time 3, and 208 (59%) completed the final mailed questionnaire at Time 4. Job change was assessed at the Time 3 telephone interviews. Participants for the job change analysis were those who completed all four waves of self-report questionnaires (Times 1 through 4), occupationally-focused interviews at Times 2 and 3, and responded to the item concerning change in employment (n = 164).

All participants provided written informed consent to take part in the RINGS study. Study protocols were reviewed and approved by the Institutional Review Boards of the Minneapolis VA Health Care System, University of Minnesota, and the Department of Defense.

Measures

Main Dependent Variables of Interest

PTSD Checklist – Military Version (PCL-M) (Weathers et al. 1993; Blanchard et al. 1996). The PCL-M is a 17-item self-report scale that assesses each of the symptoms of

PTSD experienced in the past month using a Likert-type response format from 1 to 5 as they relate to a participant's military experiences. The PCL-M is widely used in military population studies and has high overall convergent validity and test-retest reliability. The PCL-M correlates highly with other interview and self-report measures of PTSD (Blanchard et al. 1996). Participants completed the PCL-M at Times 1-4. A positive screen for symptoms of PTSD was defined as a total PCL-M score ≥ 50 and endorsement of at least one intrusion symptom, three avoidance symptoms, and two hyperarousal symptoms each at least at the moderate level (Hoge et al. 2004).

Beck Depression Inventory-II (BDI-II) (Beck et al. 1996). The BDI-II is a 21-item self-report measure of the severity of depression symptoms. The BDI-II is widely used in both clinical and non-clinical populations, and has established internal consistency and test-retest reliability (Dozois et al. 1998). Respondents are asked to rate on a 4-point scale (0-3) how often they have experienced each item in the past two weeks. A total score of 0-13 is considered minimal range, 14-19 is mild, 20-28 is moderate, and 29-63 is severe. The recommended threshold score on the BDI-II is 20 with those scoring ≥ 20 classified as experiencing symptoms of depression. Participants completed the BDI-II at Times 1-4.

Exposures of Interest

Job/Career Concerns. A modified version of the Concerns about Life and Family Disruptions scale from the Deployment Risk and Resilience Inventory (DRRI) (King et al. 2006; Vogt et al. 2008) was used. The DRRI is a collection of 14 scales designed to assess psychosocial risk and resilience factors for military personnel deployed to combat zones. It has demonstrated reliability and validity in both Gulf War (King et al. 2006) and

OIF (Vogt et al. 2008) military veteran samples. The first five items (on job/career concerns) of the 14-item Concerns about Life and Family Disruptions scale were used. The five items were rated on a Likert scale from 4 = a great deal to 1 = not at all, with 0 = not applicable; Cronbach's $\alpha = 0.71$). Participants completed the Concerns about Life and Family Disruptions scale at Times 1 and 2. Prior to deployment, soldiers were asked to anticipate how deploying would affect the items related to their current job and career. Upon return, they were asked how deployment had affected these same items. The pre-deployment (Time 1) job/career concerns score was included in regression models alone and with a variable indicating the change in job/career concerns from pre- to post-deployment. The change variable was calculated by subtracting the pre-deployment (Time 1) score from the post-deployment (Time 2) score.

Change in Employment. The item asked "Did you return to the same job (the job you consider to be your MAIN paid job or business) when you first began working after returning from Iraq?" Response options included 'Yes', 'No', and 'Doesn't apply – wasn't working before deployment'. A dichotomous (0/1) variable was created to indicate whether or not an individual returned to a different job post-deployment.

Additional Covariates

Selection of additional covariates to include in multivariate models was based on causal diagrams developed based on previous research and expert knowledge (see Figure 4; Chapter 3). For the job concerns analyses (Aim 1), the following covariates were included: gender, marital status, military rank, an indicator variable for having an OEF/OIF deployment prior to the 2006 deployment, continuous measures of PTSD symptoms and depression symptoms, measures of combat exposure and unit cohesion

during deployment, mental health services use since returning home from deployment, and measures of post-deployment social support and stressful life events. The measures of combat exposure, unit cohesion, social support, and stressful life events were assessed using four valid and reliable scales from the Deployment Risk and Resilience Inventory (DRRI) including the Combat Experiences scale, the Unit Support scale, the Post-Deployment Social Support scale, and the Post-Deployment Stressors scale, respectively (King et al. 2006; Vogt et al. 2008). Higher scores on each of these scales indicated greater levels of each construct.

For the job change analyses (Aim 2), the following covariates were included: gender, military rank, an indicator variable for having an OEF/OIF deployment prior to the 2006 deployment, a measure of combat exposure during deployment, a variable indicating whether or not any injuries were experienced during deployment, and a variable indicating whether or not a veteran was also in school at Time 3. In addition, the pre-deployment job/career concerns variable and the pre- to post-deployment job/career concerns change variable were included in the models.

Analyses

Aim 1

First, we examined the correlations between each of the individual job/career concerns items and the job concerns/career total score (both at Time 1 and Time 2) with each of the outcome measures at all time periods in the study. Next, linear regression models were employed to examine the effects of our exposure of interest on continuous measures of both symptoms of depression and PTSD at Times 2-4. In order to compare our results to those published by Riviere et al. (2011), the first set of regression models

we ran were relatively simple, and like the study by Riviere and colleagues, controlled for demographic variables and combat exposure. Next, we added measures of symptoms on the BDI-II for depression and the PCL-M for PTSD from the prior time period in each model since these symptoms could affect perceptions of job concerns or future levels of symptoms. Finally, to take advantage of our rich dataset of prospective, longitudinal data, we included a number of other important risk factors for depression and PTSD in a final set of models including mental health service use, Social Support, and Stressors. The regression analyses were conducted using proc reg in SAS 9.2 (SAS Institute Inc., Cary, NC).

Aim 2

The effect of post-deployment job change on PTSD or depression post-deployment was evaluated using a "differences-in-differences" (DD) methodology to account for potential bias from endogeneity of job change and PTSD/depression. This approach controls for unobserved sources of variability in our dependent variable (mental health symptoms) by using repeated observations from the pre- and post-deployment time periods, and identifying two groups of veterans, an experimental and control group, who differ in their return to a job post-deployment. This approach is designed to capture unobserved differences between the groups that might be correlated with post-deployment mental health symptoms.

To illustrate the approach, consider the following matrix of mental health symptoms:

	Deployment to Iraq	
Impact of Not Returning to Same Job	Pre-Deployment	Post-Deployment
Control Group – Same Job	MH00	MH01
Experimental Group – Different Job	MH10	MH11

In order to assess the impact of not returning to the same job post-deployment, one can look at the experimental group's mental health symptoms pre- and post-deployment, and compute the difference (MH11 - MH10). However, this approach ignores the fact that some of the hypothesized increase in mental health symptoms post-deployment may be due to unobserved variables such as the economic downturn that veterans returned to, as well as other changes in veterans' demographic and socio-economic conditions from the pre- to post-deployment time periods. Although one can control for these demographic and socio-economic conditions in a multivariate regression model, the advantage of the DD approach is that the veterans who returned to the same job post-deployment can be used as a control group for other time invariant unobserved differences not included in the model. Thus, the difference (MH01 - MH00) reflects the impact of any unobserved variables. Computing the difference in these differences, (MH11 - MH10) - (MH01 - MH00), yields a measure of the pure effect of not returning to the same job post-deployment on mental health symptoms.

To address our study hypothesis, the DD specification included dichotomous (0/1) variables to account for 1) whether or not it was the pre-deployment vs. the post-deployment time period, 2) whether or not a veteran returned to a different job post-deployment, and 3) the interaction between these two dichotomous variables. The interaction term between the two dichotomous variables captured the effect of returning to a different job on mental health symptoms for the experimental group vs. control group and was the coefficient of interest. Two sets of analyses were conducted assessing symptoms both at Time 3 and at Time 4. Analyses were conducted using proc mixed in SAS 9.2 (SAS Institute Inc., Cary, NC).

Results

Aim 1

For the job concerns analyses, comparing the respondents from each time period to the baseline (Time 1) RINGS cohort (n = 522), only a couple of significant differences were noted (see Table 4). Specifically, at Time 3, respondents were significantly more likely to be married (52.5% vs. 45.4% in the Time 1 cohort) and, at Time 4, respondents were of higher rank (i.e., a lower proportion was of enlisted status, 85.5% vs. 90.2% in the Time 1 cohort). Descriptive statistics on the job concerns items from the Concerns about Life and Family Disruptions scale are given in Table 5.

Aim 2

For the job change analyses, comparing the occupational cohort (n = 164) to the baseline RINGS cohort (n = 522), veterans in the occupational cohort differed significantly from the larger cohort on two variables (see Table 4). Specifically, the veterans included in these analyses were significantly more likely to be married (56.8% vs. 45.4% in the RINGS cohort) and of higher rank (i.e., a lower proportion was of enlisted status, 82.2% vs. 90.2% in the RINGS cohort). Overall, 83 veterans returned to a different job post-deployment (i.e., experienced a job change), while 81 veterans returned to the same job post-deployment.

Job Concerns Analyses: Correlations and Linear Regression Models

In examining the correlations between pre-deployment job concerns and symptoms of PTSD and depression at each time period in the study, we saw modest, but significant correlations between the total job concerns score as well as almost every individual item and symptoms of both PTSD and depression at each time period (Tables

6 and 7).This was not the case for post-deployment job concerns. In general, correlations between job concerns measured at Time 2 and symptoms of PTSD and depression were smaller, except when assessed cross-sectionally at Time 2; the correlation between the total job concerns scores and mental health symptoms at Time 2 was 0.20 and 0.21 ($p < 0.001$) for PTSD and depression, respectively (Tables 5 and 6). At Times 3 and 4, only a single job concerns item assessed post-deployment was consistently and significantly correlated with symptoms of depression and PTSD – concern for being unable to support one's family while away (Tables 8 and 9).

Similar to Riviere et al. (2011), although assessed longitudinally, in addressing our first hypothesis that veterans who experienced greater job concerns prior to deploying to Iraq would have more symptoms post-deployment, we found pre-deployment job concerns to be a significant predictor of symptoms of depression and PTSD in all models when controlling only for demographic variables and combat exposure (Tables 10-15). However, when symptom measures from the prior time period were added to the models (Tables 16-21), we found evidence in support of our hypothesis in only a single model predicting PTSD symptoms at Time 3 (one year) (see Table 19). In this model, pre-deployment job concerns was a significant predictor of PTSD symptoms, after controlling for demographic variables, combat exposure, and Time 2 measures of PTSD and depression symptoms. Upon examination of the final models which included a number of other important covariates (Tables 22-27), this association remained significant in the Time 3 PTSD model; the parameter estimate indicated that for every one unit increase in pre-deployment job concerns, veterans experienced a statistically significant increase in PTSD symptoms of 0.37 units (Table 25). However, our exposure of interest was not a

significant predictor of symptoms in any of the final Time 2 models (Tables 22-23), the Time 3 depression model (Table 24), or the Time 4 models after controlling for prior symptoms and other important risk factors for depression and PTSD (Tables 26-27).

In addressing our second hypothesis that NG veterans who experienced an increase in job concerns from pre- to post-deployment would have more symptoms of PTSD and depression immediately upon return, and at one and two years post-deployment compared to their peers who experienced no change or a decrease in concerns, we found evidence in support of this hypothesis in both models predicting depression and PTSD symptoms at Time 2 when controlling only for demographic variables and combat exposure (Tables 28-29). These associations remained significant when adding prior symptom measures to the models (Tables 30-31). In the final Time 2 models (Tables 32-33), an increase in job concerns from pre- to post-deployment was a significant predictor of PTSD symptoms only, after controlling for pre-deployment job concerns, pre-deployment depression and PTSD symptoms, and a number of other important covariates (Table 33). In this model, the parameter estimate indicated that for every one unit increase in pre-deployment to post-deployment job concerns, veterans experienced a statistically significant increase in PTSD symptoms of 0.38 units. Our exposures of interest were not significant predictors of symptoms in any of the Time 3 models (Tables 34-39) or the Time 4 models after controlling for prior symptoms and other important risk factors for depression and PTSD (Tables 40-45).

Job Change Analyses: Differences-in-Differences Models

Overall, a change in employment had no significant effect on symptoms of either PTSD or depression at Time 3 or Time 4, in contrast to our hypotheses. Veterans who

returned to a different job post-deployment had slightly greater changes in pre- to post-deployment symptoms of PTSD and depression at either time period compared to their peers who returned to the same job post-deployment, but these changes did not reach statistical significance. Crude mean scores on both the PCL and BDI instruments were similar for both groups at each time point across all time points assessed in the study. Estimates from all models indicated a significant worsening of symptoms from pre- to post-deployment for both groups with insignificant interaction terms in all models (the coefficients capturing the effect of returning to a different job on mental health symptoms) (Tables 46-49a).

At Time 3, findings from adjusted models indicated an average increase in symptoms of PTSD of 11.1 points in the different job group vs. an average increase of 9.5 points in the same job group (see Table 46a). The difference was slightly bigger for changes on the BDI; there was an average increase in symptoms of depression of 6.7 points in the different job group vs. an average increase of 4.8 points in the same job group (see Table 47a).

At Time 4, the differences between the different job and same job groups were slightly bigger for both symptoms of PTSD and depression, but again, the interaction terms were not significant. Estimates from adjusted models indicated an average increase in symptoms of PTSD of 11.3 points in the different job group vs. an average increase of 8.6 points in the same job group (see Table 48a). At two years, there was an average increase in symptoms of depression of 6.7 points in the different job group vs. an average increase of 4.3 points in the same job group (see Table 49a). Finally, of note, pre-

deployment job concerns was consistently a significant predictor in all of the job change analyses models (see Tables 46-49).

Discussion

Overall, in this study we found limited evidence that job concerns or a change in jobs post-deployment affects subsequent mental health symptoms, but our findings extend the work of Riviere et al. (2011) in a number of important ways. Like Riviere and colleagues, we found significant correlations and significance in multivariate models controlling for demographics and combat exposure between job concerns and symptoms of both depression and PTSD, but this was particularly true when job concerns were assessed prior to deployment. The study conducted by Riviere and colleagues did not include a measure of pre-deployment job concerns. Showing that job concerns are present prior to deployment and are consistently correlated with symptoms of depression and PTSD up to two years post-deployment illustrates that the pre-deployment time period may be an important time to address such concerns. Particularly for NGR troops whose military service is relatively part-time and who retain commitments to civilian jobs, issues and concerns surrounding the transition to and from civilian employment may represent an important topic area to incorporate into psychological resiliency training. Psychological resilience is defined as the capacity to adapt successfully in the presence of risk and adversity (Jensen and Fraser, 2005) and with increasing media attention on the mental health conditions and cognitive impairments affecting many OEF/OIF service members, resiliency training has become an important priority for the Department of Defense (DoD) and the Department of Veterans Affairs (VA) as well as a number of civilian organizations.

There are a growing number of programs and strategies provided by the military and civilian sectors to encourage and support psychological resilience to stress for service members and their families. A key distinction between approaches to promote resilience compared to traditional medical interventions is an emphasis on prevention as opposed to treatment with programs addressing multiple phases of military deployment including pre-deployment, in theater, and post-deployment phases. In a recent literature and program review of psychological resilience in the military conducted by RAND, the research team found 20 evidence-informed factors associated with resilience that could be summarized as either intrinsic (or individual) factors that promote resilience or resilience factors that involve other individuals who are part of a group (e.g., family, organization (or military unit), and community). While civilian employment wasn't specifically mentioned in this review, our results indicate that the concerns NG service members have regarding their civilian jobs prior to deploying do impact future mental health symptoms and that addressing such concerns in the context of pre-deployment resiliency training specifically could potentially alleviate concerns and promote resilience in this special population of veterans.

While we did find significant correlations and significance in all multivariate models when controlling for demographics and combat exposure, as our models became more comprehensive, including prior symptom measures and other important risk factors for depression and PTSD, the presence of higher job concerns prior to deploying remained a significant predictor in only a single model predicting symptoms of PTSD at Time 3, approximately one year post-deployment. Nonetheless, these findings represent an important extension of prior work which was limited to cross-sectional associations

and relatively simple multivariate models. We were able to show, utilizing a longitudinal design and controlling for a number of additional important covariates, that pre-deployment job concerns contribute to an increase in PTSD symptoms in this sample of NG veterans. In addition, the pre-deployment job concerns measure was significant in all of the job change models. That is, those veterans who returned to a different job post-deployment also expressed more job concerns prior to deploying and had, in general, greater changes in mental symptoms from pre- to post-deployment.

Additionally, experiencing a change in job concerns, an increase in concerns from pre- to immediately post-deployment, significantly predicted an increase in symptoms of depression and PTSD at Time 2, immediately post-deployment. However, since this change in job concerns and the symptoms of depression and PTSD were assessed at the same time, the association is more cross-sectional than longitudinal in nature. Because of this measurement issue, it is difficult to determine whether symptoms preceded the increase in job concerns or whether the increase in job concerns was partly responsible for the increase in mental health symptoms in this time period. Since we did not find the same significant association in the models at one and two years post-deployment, perhaps the former is the case, that immediately post-deployment an increase in mental symptoms explains the increase in job concerns.

Finally, while the veterans who returned to a different job post-deployment had greater changes in mental symptoms from pre- to post-deployment in the differences-in-differences models, none of these differences were significantly different from the group of veterans who returned to the same job post-deployment. Contrary to our hypothesis, job change appeared to have no significant effects on symptoms of either PTSD or

depression at either of the time periods assessed. We have some evidence to suggest that for many veterans changing jobs post-deployment, it was indeed a positive change. In a sub-group of veterans (n = 42) who changed jobs multiple times post-deployment, a majority (87%) viewed their current job as a better job than previous ones. In one study examining the effects of job change on job satisfaction and mental strain in metal-working personnel in Finland, the effect of job change on mental well-being was positive and was predicted by changes in job content, changes in the work environment, and changes in supervisor relations (Kirjonen and Hänninen 1984). While we hypothesized that a post-deployment change in employment would have a negative effect on mental well-being, even if voluntary and perceived as desirable (confirmed in a sub-group of our sample), this does not appear to be the case in our study as job change had no significant effects on symptoms of either PTSD or depression. It may be that other factors, both measured (e.g., prior deployment, combat experience, job concerns) and unmeasured, subdue any perceived effect of a job change on mental health among these veterans.

Study limitations should be considered when interpreting our findings. First, the occupational cohort utilized in the study was relatively small and from a single National Guard Brigade Combat Team. As noted by Riviere et al. (2011), National Guard brigades, unlike active component brigades, are largely composed of soldiers from a single area or state, which potentially limits the generalizability of study findings. Indeed, data from the Army and the Defense Manpower Data Center indicate that compared to the entire population of U.S. Army National Guard (NG) soldiers in fiscal year 2006, our sample was less racially diverse (U.S. Army Profile FY06). Although representative of the racial composition of the overall Brigade Combat Team and the larger RINGS cohort

(Polusny et al. 2011), our occupational cohort was predominantly white (96%) compared with 74.5% of the U.S. Army NG population. In addition, we found that the veterans included in our occupational cohort were significantly more likely to be married and of higher rank than the veterans in the larger RINGS cohort, which again has implications for generalizability. The RINGS cohort more closely aligned with the national data with 90.2% enlisted status compared to 89.4% nationally and 45.4% married compared to 46.5% of the U.S. Army NG population (U.S. Army Profile FY06). Second, our dependent variables relied on instruments measuring symptoms of mental health as opposed to clinical diagnoses. However, the BDI-II and PCL-M are symptom measures that are widely used and have good reliability and validity (Dozois et al. 1998; Weathers et al. 1993). In addition, there is growing recognition that post-deployment psychological problems need not be present at clinical levels to have a significant negative impact on personal and occupational functioning (Ford et al. 2001).

There was some evidence in addressing Specific Aim 2 (job change analyses) of selective attrition from the sample. That is, non-responders at Times 3 and 4 tended to have greater symptom severity scores for PTSD and depression in the previous time period than responders. For example, mean scores on the PCL-M at Time 2 were 34.9 (SD = 13.3) for Time 3 responders and 38.3 (SD = 15.7) for Time 3 non-responders. Likewise, mean scores on the BDI-II at Time 2 were 9.6 (SD = 8.2) for Time 3 responders and 10.0 (SD = 8.3) for Time 3 non-responders. At Time 3, mean scores on the PCL-M were 35.1 (SD = 14.4) for Time 4 responders and 38.0 (SD = 16.5) for Time 4 non-responders. Likewise, mean scores on the BDI-II at Time 3 were 10.8 (SD = 9.3) for Time 4 responders and 12.3 (SD = 9.6) for Time 4 non-responders. In order to address

this potential source of non-response bias in our analyses, additional analyses were conducted including the non-responders making assumptions regarding their job change status. We re-ran all the job change models under the assumption that all non-responders had changed jobs and again under the assumption that all non-responders had not changed jobs. Neither of these approaches changed our results; that is, job change appeared to have no significant effects on symptoms of either PTSD or depression at either of the time periods assessed.

Conclusions

While the evidence we found regarding the effects of job concerns or a change in jobs post-deployment on subsequent mental health symptoms was somewhat limited, our results indicate that the concerns NG service members have regarding their civilian jobs prior to deploying impact future mental health symptoms; addressing such concerns in the context of pre-deployment resiliency training could potentially alleviate concerns and promote resilience in this special population of veterans. This study extended upon prior research by examining NG-specific variables utilizing a longitudinal design.

Table 4. Demographics and outcome measures

	RINGS Cohort Time 1 Respondents (n = 522)	RINGS Cohort Time 2 Respondents (n = 424)	RINGS Cohort Time 3 Respondents (n = 343)	RINGS Cohort Time 4 Respondents (n = 296)	Occupational Cohort with Complete Exposure Assessment (n = 164)
Demographics					
Age at Pre-Deployment (M, SD)	29.1, 8.6	29.9, 8.8	30.3, 8.7	30.6, 9.1	31.0, 8.8
Race (N (% White))	490 (93.9%)	403 (95.1%)	326 (95.0%)	282 (95.3%)	162 (95.9%)
Gender (N (% Male))	462 (88.5%)	372 (87.7%)	304 (88.6%)	257 (86.8%)	148 (87.6%)
Marital Status (N (% Married))	237 (45.4%)	207 (48.8%)	180 (52.5%)*	147 (49.7%)	96 (56.8%)*
Years of Education (M, SD)	14.2, 2.0	14.4, 2.0	14.5, 2.1	14.6, 2.1	14.8, 2.2
Military Rank (N (% Enlisted))	471 (90.2%)	377 (88.9%)	300 (87.5%)	353 (85.5%)*	139 (82.2%)*
Outcomes					
Screened positive for symptoms of PTSD† (N (%))	19 (3.7%)	68 (16.2%)	63 (18.5%)	51 (17.3%)	20 (11.8%)
Screened positive for symptoms of depression‡ (N (%))	30 (5.8%)	52 (12.4%)	68 (20.1%)	58 (19.7%)	24 (14.4%)
Screened positive for both (N (%))	10 (1.9%)	33 (7.8%)	40 (11.7%)	32 (10.8%)	11 (6.5%)

†A positive screen for symptoms of PTSD indicates a total PCL-M score ≥ 50 and endorsement of at least one intrusion symptom, three avoidance symptoms, and two hyperarousal symptoms each at the moderate or higher level.

‡A positive screen for symptoms of depression indicates a total BDI-II score ≥ 20.

*$p < 0.05$; indicates significant differences compared to baseline (Time 1) RINGS cohort.

Table 5. Items from modified version of the Concerns about Life and Family Disruptions scale at Times 1 and 2

	Pre-Deployment Job Concerns Mean (SD)	Post-Deployment Job Concerns Mean (SD)
While I was deployed, I was concerned about…		
…missing out on a promotion at my job back home.	1.50 (0.92)	1.67 (1.07)
…missing out on opportunities to start a career while I was away.	2.26 (1.12)	2.54 (1.26)
…damaging my career because I was overseas for a long time.	1.82 (1.05)	2.26 (1.24)
…losing touch with my co-workers or supervisors back home.	1.68 (0.90)	2.07 (1.13)
…being unable to financially support my family while I was away.	1.27 (0.61)	1.42 (0.85)
Total Mean Score on modified version of the Concerns about Life and Family Disruptions scale	8.54 (3.20)	9.93 (3.76)

Table 6. Correlations among pre-deployment job concerns (by item and total score) and the PTSD Checklist (PCL-M)

	Time 1 PCL-M Total	Time 2 PCL-M Total	Time 3 PCL-M Total	Time 4 PCL-M Total
While I was deployed, I was concerned about…				
…missing out on a promotion at my job back home.	0.10*	0.06	0.13*	0.08
…missing out on opportunities to start a career while I was away.	0.21***	0.12*	0.12*	0.08
…damaging my career because I was overseas for a long time.	0.17***	0.12*	0.21***	0.17**
…losing touch with my co-workers or supervisors back home.	0.18***	0.16**	0.11*	0.14*
…being unable to financially support my family while I was away.	0.15***	0.10*	0.21***	0.19***
Total Mean Score	0.24***	0.16***	0.22***	0.19**

*p < 0.05; **p < 0.01; ***p < 0.001.

Table 7. Correlations among pre-deployment job concerns (by item and total score) and the Beck Depression Inventory (BDI-II)

	Time 1 BDI-II Total	Time 2 BDI-II Total	Time 3 BDI-II Total	Time 4 BDI-II Total
While I was deployed, I was concerned about…				
…missing out on a promotion at my job back home.	0.09*	0.06	0.12*	0.09
…missing out on opportunities to start a career while I was away.	0.16***	0.13**	0.12*	0.09
…damaging my career because I was overseas for a long time.	0.15***	0.12*	0.19***	0.13*
…losing touch with my co-workers or supervisors back home.	0.16***	0.19***	0.16**	0.13*
…being unable to financially support my family while I was away.	0.14**	0.17***	0.18***	0.15**
Total Mean Score	0.20***	0.19***	0.22***	0.17**

*p < 0.05; **p < 0.01; ***p < 0.001.

Table 8. Correlations among post-deployment job concerns (by item and total score) and the PTSD Checklist (PCL-M)

	Time 2 PCL-M Total	Time 3 PCL-M Total	Time 4 PCL-M Total
While I was deployed, I was concerned about…			
…missing out on a promotion at my job back home.	0.11*	0.08	0.07
…missing out on opportunities to start a career while I was away.	0.19***	0.07	0.05
…damaging my career because I was overseas for a long time.	0.09	0.06	0.05
…losing touch with my co-workers or supervisors back home.	0.10*	0.04	0.09
…being unable to financially support my family while I was away.	0.17***	0.25***	0.23***
Total Mean Score	0.20***	0.14*	0.13*

*p < 0.05; **p < 0.01; ***p < 0.001.

Table 9. Correlations among post-deployment job concerns (by item and total score) and the Beck Depression Inventory (BDI-II)

	Time 2 BDI-II Total	Time 3 BDI-II Total	Time 4 BDI-II Total
While I was deployed, I was concerned about…			
…missing out on a promotion at my job back home.	0.10*	0.09	0.04
…missing out on opportunities to start a career while I was away.	0.19***	0.06	0.07
…damaging my career because I was overseas for a long time.	0.13*	0.09	0.006
…losing touch with my co-workers or supervisors back home.	0.09	0.05	0.07
…being unable to financially support my family while I was away.	0.20***	0.19***	0.15*
Total Mean Score	0.21***	0.14*	0.09

*p < 0.05; **p < 0.01; ***p < 0.001.

Table 10. Determinants of depression symptoms at Time 2 in NG veterans – job concerns, demographics and combat

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.4323	0.1218	3.55	0.000	0.1675
Gender	-5.1195	1.1993	-4.27	<0.000	-0.2067
Marital Status	0.6439	0.7898	0.82	0.415	0.0396
Military Rank	-1.0177	0.12625	-0.81	0.421	-0.0393
Prior OEF/OIF Deployment	-1.8143	1.7792	-1.02	0.309	-0.0489
Time 2 DRRI Combat Scale Score	0.2173	0.0476	4.56	<0.000	0.2243
Constant	4.8887	2.1707	2.25	0.025	0

R-Square = 0.1026; Adj R-Square = 0.0894

Table 11. Determinants of PTSD symptoms at Time 2 in NG veterans – job concerns, demographics and combat

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.6787	0.1941	3.50	0.001	0.1532
Gender	-9.4946	1.9055	-4.98	<0.000	-0.2244
Marital Status	0.1622	1.2566	0.13	0.897	0.0058
Military Rank	0.4881	2.0015	0.24	0.807	0.0110
Prior OEF/OIF Deployment	-3.0604	2.8501	-1.07	0.284	-0.0479
Time 2 DRRI Combat Scale Score	0.6695	0.0764	9.16	<0.000	0.4188
Constant	17.6764	3.4613	5.11	<0.000	0

R-Square = 0.2174; Adj R-Square = 0.2060

Table 12. Determinants of depression symptoms at Time 3 in NG veterans – job concerns, demographics and combat

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.5989	0.1581	3.79	0.000	0.2054
Gender	-3.7699	1.5918	-2.37	0.019	-0.1330
Marital Status	0.2796	1.0329	0.27	0.787	0.0151
Military Rank	-0.1610	1.5439	-0.10	0.917	-0.0059
Prior OEF/OIF Deployment	1.8088	2.4925	0.73	0.469	0.0399
Time 2 DRRI Combat Scale Score	0.2209	0.0682	3.24	0.001	0.1829
Constant	2.8130	2.8220	1.00	0.320	0

R-Square = 0.0873; Adj R-Square = 0.0698

Table 13. Determinants of PTSD symptoms at Time 3 in NG veterans – job concerns, demographics and combat

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	1.0310	0.2380	4.33	<0.000	0.2233
Gender	-7.0604	2.3982	-2.94	0.004	-0.1571
Marital Status	0.6986	1.5539	0.45	0.653	0.0238
Military Rank	2.4439	2.3277	1.05	0.295	0.0561
Prior OEF/OIF Deployment	2.1062	3.7558	0.56	0.575	0.0293
Time 2 DRRI Combat Scale Score	0.6148	0.1030	5.97	<0.000	0.3203
Constant	12.9551	4.2523	3.05	0.003	0

R-Square = 0.1737; Adj R-Square = 0.1580

Table 14. Determinants of depression symptoms at Time 4 in NG veterans – job concerns, demographics and combat

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.5313	0.1830	2.90	0.004	0.1656
Gender	-4.5524	1.7491	-2.60	0.010	-0.1551
Marital Status	-0.2060	1.1875	-0.17	0.862	-0.0103
Military Rank	1.0738	1.6605	0.65	0.518	0.0386
Prior OEF/OIF Deployment	5.1425	2.8647	1.80	0.074	0.1049
Time 2 DRRI Combat Scale Score	0.3658	0.0798	4.59	<0.000	0.2750
Constant	-0.2961	3.1549	-0.09	0.925	0

R-Square = 0.1405; Adj R-Square = 0.1211

Table 15. Determinants of PTSD symptoms at Time 4 in NG veterans – job concerns, demographics and combat

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.9742	0.2805	3.47	0.001	0.1927
Gender	-3.9329	2.6863	-1.46	0.144	-0.0848
Marital Status	0.8647	1.8183	0.48	0.635	0.0273
Military Rank	2.5740	2.5516	1.01	0.314	0.0585
Prior OEF/OIF Deployment	3.8732	4.4006	0.88	0.380	0.0500
Time 2 DRRI Combat Scale Score	0.7440	0.1218	6.11	<0.000	0.3564
Constant	13.8487	4.8426	1.43	0.155	0

R-Square = 0.1812; Adj R-Square = 0.1629

Table 16. Determinants of depression symptoms at Time 2 in NG veterans – job concerns, demographics, combat and prior symptoms

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.1348	0.1188	1.14	0.257	0.0523
Gender	-3.4481	1.1454	-3.01	0.003	-0.1396
Marital Status	2.2112	0.7605	2.91	0.004	0.1358
Military Rank	-1.2541	1.1700	-1.07	0.284	-0.0486
Prior OEF/OIF Deployment	-4.1222	1.6700	-2.47	0.014	-0.1115
Time 2 DRRI Combat Scale Score	0.1861	0.0454	4.10	<0.000	0.1920
Time 1 BDI-II Score	0.3397	0.0857	3.96	<0.000	0.2767
Time 1 PCL-M Score	0.1332	0.0596	2.23	0.260	0.1583
Constant	0.9928	2.1239	0.47	0.640	0

R-Square = 0.2371; Adj R-Square = 0.2219

Table 17. Determinants of PTSD symptoms at Time 2 in NG veterans – job concerns, demographics, combat and prior symptoms

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.2557	0.1945	1.31	0.189	0.0578
Gender	-7.9614	1.8735	-4.25	<0.000	-0.1885
Marital Status	2.3700	1.2437	1.91	0.057	0.0848
Military Rank	0.3817	1.9056	0.20	0.841	0.0087
Prior OEF/OIF Deployment	-6.1942	2.7484	-2.25	0.025	-0.0971
Time 2 DRRI Combat Scale Score	0.6243	0.0748	8.35	<0.000	0.3736
Time 1 BDI-II Score	0.1801	0.1401	1.29	0.199	0.0860
Time 1 PCL-M Score	0.3635	0.0978	3.72	0.000	0.2512
Constant	10.8295	3.4851	3.11	0.002	0

R-Square = 0.2974; Adj R-Square = 0.2836

Table 18. Determinants of depression symptoms at Time 3 in NG veterans – job concerns, demographics, combat and prior symptoms

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.2374	0.1307	1.82	0.070	0.0815
Gender	0.2995	1.3259	0.23	0.821	0.0106
Marital Status	-0.2608	0.8397	-0.31	0.756	-0.0141
Military Rank	-0.2454	1.2597	-0.19	0.846	-0.0089
Prior OEF/OIF Deployment	0.4188	2.0069	0.21	0.835	0.0093
Time 2 DRRI Combat Scale Score	0.0162	0.0596	0.27	0.786	0.0135
Time 2 BDI-II Score	0.5123	0.0781	6.56	<0.000	0.4472
Time 2 PCL-M Score	0.1438	0.0501	2.87	0.004	0.2080
Constant	-1.4696	2.3740	-0.62	0.536	0

R-Square = 0.4128; Adj R-Square = 0.3975

Table 19. Determinants of PTSD symptoms at Time 3 in NG veterans – job concerns, demographics, combat and prior symptoms

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.5325	0.2003	2.66	0.008	0.1152
Gender	-0.3072	2.0315	-0.15	0.880	-0.0069
Marital Status	0.1392	1.2857	0.11	0.914	0.0047
Military Rank	1.4810	1.9308	0.77	0.444	0.0338
Prior OEF/OIF Deployment	0.0043	3.0736	0.00	0.999	0.0001
Time 2 DRRI Combat Scale Score	0.2018	0.0915	2.21	0.028	0.1055
Time 2 BDI-II Score	0.1610	0.1197	1.35	0.180	0.0886
Time 2 PCL-M Score	0.5742	0.0766	7.49	<0.000	0.5238
Constant	2.6677	3.6327	0.73	0.463	0

R-Square = 0.4541; Adj R-Square = 0.4399

Table 20. Determinants of depression symptoms at Time 4 in NG veterans – job concerns, demographics, combat and prior symptoms

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	-0.1020	0.1320	-0.77	0.440	-0.0317
Gender	-1.3430	1.2564	-1.07	0.286	-0.0451
Marital Status	0.0620	0.8352	0.07	0.941	0.0031
Military Rank	1.5968	1.1465	1.39	0.165	0.0581
Prior OEF/OIF Deployment	4.1047	1.9170	2.14	0.033	0.0871
Time 2 DRRI Combat Scale Score	0.1115	0.0594	1.88	0.062	0.0824
Time 3 BDI-II Score	0.6447	0.0740	8.72	<0.000	0.5965
Time 3 PCL-M Score	0.1296	0.0504	2.57	0.012	0.1834
Constant	-2.744	2.2962	-1.20	0.233	0

R-Square = 0.6278; Adj R-Square = 0.6153

Table 21. Determinants of PTSD symptoms at Time 4 in NG veterans – job concerns, demographics, combat and prior symptoms

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.0548	0.1875	0.29	0.770	0.0109
Gender	1.4874	1.7889	0.83	0.407	0.0320
Marital Status	0.8137	1.1851	0.69	0.493	0.0258
Military Rank	1.8011	1.6334	1.10	0.271	0.0419
Prior OEF/OIF Deployment	2.3372	2.7304	0.86	0.393	0.0317
Time 2 DRRI Combat Scale Score	0.2171	0.0844	2.57	0.011	0.1034
Time 3 BDI-II Score	0.1981	0.1051	1.88	0.061	0.1172
Time 3 PCL-M Score	0.7569	0.0715	10.58	<0.000	0.6871
Constant	-3.5512	3.2631	-1.09	0.278	0

R-Square = 0.6882; Adj R-Square = 0.6779

Table 22. Determinants of depression symptoms at Time 2 in NG veterans – job concerns, demographics, combat, prior symptoms and other covariates

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.0214	0.1030	0.21	0.835	0.0083
Gender	-2.8117	0.9849	-2.85	0.005	-0.1149
Marital Status	1.6431	0.6653	2.47	0.014	0.1007
Military Rank	-1.4348	1.0358	-1.39	0.167	-0.0545
Prior OEF/OIF Deployment	-4.0432	1.4467	-2.79	0.006	-0.1105
Time 2 DRRI Unit Support Scale Score	-0.0862	0.0293	-2.94	0.004	-0.1195
Time 2 DRRI Combat Scale Score	0.1361	0.0409	3.33	0.001	0.1404
Time 1 BDI-II Score	0.2304	0.0752	3.06	0.002	0.1884
Time 1 PCL-M Score	0.0814	0.0523	1.56	0.121	0.0964
Time 2 Mental Health Service Use	1.5347	0.6803	2.26	0.025	0.0890
Time 2 DRRI Social Support Scale Score	-0.3243	0.0409	-7.93	<0.000	-0.3331
Time 2 DRRI Stressors Scale Score	1.0982	0.2398	4.58	<0.000	0.1909
Constant	25.9928	3.1018	8.38	<0.000	0

R-Square = 0.4500; Adj R-Square = 0.4330

Table 23. Determinants of PTSD symptoms at Time 2 in NG veterans – job concerns, demographics, combat, prior symptoms and other covariates

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.0771	0.1701	0.45	0.650	0.0176
Gender	-7.2594	1.6220	-4.48	<0.000	-0.1748
Marital Status	1.2266	1.0971	1.12	0.264	0.0441
Military Rank	0.8580	1.6945	0.51	0.613	0.0192
Prior OEF/OIF Deployment	-6.0182	2.3985	-2.51	0.013	-0.0961
Time 2 DRRI Unit Support Scale Score	-0.0326	0.0482	-0.68	0.499	-0.0266
Time 2 DRRI Combat Scale Score	0.5209	0.0677	7.70	<0.000	0.3141
Time 1 BDI-II Score	-0.0398	0.1238	-0.32	0.748	-0.0193
Time 1 PCL-M Score	0.3136	0.0865	3.63	0.000	0.2177
Time 2 Mental Health Service Use	3.9003	1.1240	3.47	0.001	0.1324
Time 2 DRRI Social Support Scale Score	-0.6466	0.0674	-9.60	<0.000	-0.3898
Time 2 DRRI Stressors Scale Score	0.7458	0.3843	1.94	0.053	0.0778
Constant	54.5888	5.1277	10.65	<0.000	0

R-Square = 0.4776; Adj R-Square = 0.4616

Table 24. Determinants of depression symptoms at Time 3 in NG veterans – job concerns, demographics, combat, prior symptoms and other covariates

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.1507	0.1240	1.22	0.225	0.0517
Gender	-0.1835	1.2551	-0.15	0.884	-0.0065
Marital Status	-0.3734	0.7953	-0.47	0.639	-0.0201
Military Rank	-0.3606	1.2003	-0.30	0.764	-0.0131
Prior OEF/OIF Deployment	0.4682	1.9036	0.25	0.806	0.0104
Time 2 DRRI Unit Support Scale Score	0.0469	0.0375	1.25	0.212	0.0571
Time 2 DRRI Combat Scale Score	-0.0145	0.0572	-0.25	0.800	-0.0121
Time 2 BDI-II Score	0.4462	0.0761	5.86	<0.000	0.3893
Time 2 PCL-M Score	0.0559	0.0495	1.13	0.260	0.0806
Time 3 Mental Health Service Use	2.7542	0.8877	3.10	0.002	0.1466
Time 3 DRRI Social Support Scale Score	-0.1698	0.0474	-3.58	0.000	-0.1736
Time 3 DRRI Stressors Scale Score	0.7534	0.2091	3.60	0.000	0.1672
Constant	9.2636	3.8868	2.380	0.018	0

R-Square = 0.4922; Adj R-Square = 0.4720

Table 25. Determinants of PTSD symptoms at Time 3 in NG veterans – job concerns, demographics, combat, prior symptoms and other covariates

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.3723	0.1809	2.06	0.040	0.0808
Gender	-1.1143	1.8301	-0.61	0.543	-0.0250
Marital Status	0.0311	1.1610	0.03	0.979	0.0011
Military Rank	1.1031	1.7511	0.63	0.529	0.0253
Prior OEF/OIF Deployment	0.1539	2.7758	0.06	0.956	0.0022
Time 2 DRRI Unit Support Scale Score	0.0481	0.0541	0.89	0.375	0.0372
Time 2 DRRI Combat Scale Score	0.1524	0.0834	1.83	0.069	0.0799
Time 2 BDI-II Score	0.0349	0.1110	0.31	0.753	0.0192
Time 2 PCL-M Score	0.4047	0.0721	5.61	<0.000	0.3697
Time 3 Mental Health Service Use	5.0438	1.2970	3.89	0.000	0.1695
Time 3 DRRI Social Support Scale Score	-0.2886	0.0690	-4.18	<0.000	-0.1863
Time 3 DRRI Stressors Scale Score	1.5866	0.3041	5.22	<0.000	0.2225
Constant	22.2282	5.6783	3.91	0.000	0

R-Square = 0.5698; Adj R-Square = 0.5527

Table 26. Determinants of depression symptoms at Time 4 in NG veterans – job concerns, demographics, combat, prior symptoms and other covariates

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	-0.1701	0.1220	-1.39	0.165	-0.0530
Gender	-1.7685	0.1540	-1.53	0.127	-0.0599
Marital Status	0.7164	0.7731	0.93	0.355	0.0355
Military Rank	1.8343	1.0548	1.74	0.083	0.0672
Prior OEF/OIF Deployment	3.2321	1.7813	1.81	0.071	0.0692
Time 2 DRRI Unit Support Scale Score	-0.0227	0.0362	-0.63	0.531	-0.0243
Time 2 DRRI Combat Scale Score	0.1072	0.0553	1.94	0.054	0.0795
Time 3 BDI-II Score	0.5687	0.0693	8.21	<0.000	0.5283
Time 3 PCL-M Score	0.0438	0.0497	0.88	0.379	0.0621
Time 4 Mental Health Service Use	1.5529	0.8797	1.77	0.079	0.0765
Time 4 DRRI Social Support Scale Score	-0.2319	0.0444	-5.22	<0.000	-0.2412
Time 4 DRRI Stressors Scale Score	0.3631	0.2273	1.60	0.112	0.0669
Constant	14.4939	3.8552	3.76	0.000	0

R-Square = 0.6949; Adj R-Square = 0.6792

Table 27. Determinants of PTSD symptoms at Time 4 in NG veterans – job concerns, demographics, combat, prior symptoms and other covariates

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	-0.0517	0.1784	-0.29	0.772	-0.0103
Gender	0.9516	1.6902	0.56	0.574	0.0206
Marital Status	1.6588	1.1281	1.47	0.143	0.0526
Military Rank	2.4507	1.5459	1.59	0.114	0.0573
Prior OEF/OIF Deployment	1.9904	2.6099	0.76	0.447	0.0272
Time 2 DRRI Unit Support Scale Score	0.0020	0.0527	0.04	0.970	0.0014
Time 2 DRRI Combat Scale Score	0.2026	0.0809	2.51	0.013	0.0965
Time 3 BDI-II Score	0.1371	0.1014	1.35	0.178	0.0812
Time 3 PCL-M Score	0.6062	0.0724	8.37	<0.000	0.5495
Time 4 Mental Health Service Use	3.5427	1.2815	2.76	0.006	0.1116
Time 4 DRRI Social Support Scale Score	-0.2384	0.0649	-3.67	0.000	-0.1588
Time 4 DRRI Stressors Scale Score	0.7640	0.3317	2.30	0.022	0.0899
Constant	13.8487	5.6308	2.46	0.015	0

R-Square = 0.7312; Adj R-Square = 0.7175

Table 28. Determinants of depression symptoms at Time 2 in NG veterans – job concerns, change in concerns, demographics and combat

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.5623	0.1313	4.28	<0.000	0.2161
Change in Job Concerns (Time 2-Time 1)	0.2910	0.1197	2.43	0.015	0.1236
Gender	-4.9389	1.1952	-4.13	<0.000	-0.1996
Marital Status	0.4898	0.7937	0.62	0.538	0.0301
Military Rank	-0.7033	1.2804	-0.55	0.583	-0.0269
Prior OEF/OIF Deployment	-1.7186	1.7721	-0.97	0.333	-0.0464
Time 2 DRRI Combat Scale Score	0.2063	0.0477	4.32	<0.000	0.2130
Constant	3.3743	2.2542	1.50	0.135	0

R-Square = 0.1172; Adj R-Square = 0.1019

Table 29. Determinants of PTSD symptoms at Time 2 in NG veterans – job concerns, change in concerns, demographics and combat

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.8954	0.2096	4.27	<0.000	0.2004
Change in Job Concerns (Time 2-Time 1)	0.4873	0.1914	2.55	0.011	0.1203
Gender	-9.2110	1.8982	-4.85	<0.000	-0.2178
Marital Status	-0.1630	1.2628	-0.13	0.897	-0.0058
Military Rank	1.0602	2.0280	0.52	0.601	0.0238
Prior OEF/OIF Deployment	-2.8672	2.8371	-1.01	0.313	-0.0449
Time 2 DRRI Combat Scale Score	0.6840	0.0765	8.95	<0.000	0.4095
Constant	15.0344	3.5938	4.18	<0.000	0

R-Square = 0.2317; Adj R-Square = 0.2185

Table 30. Determinants of depression symptoms at Time 2 in NG veterans – job concerns, change in concerns, demographics, combat and prior symptoms

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.2658	0.1264	2.10	0.036	0.1023
Change in Job Concerns (Time 2-Time 1)	0.3135	0.1119	2.80	0.005	0.1332
Gender	-3.3990	1.1379	-2.93	0.004	-0.1354
Marital Status	2.0313	0.7615	2.67	0.008	0.1245
Military Rank	-0.9084	1.1843	-0.77	0.444	-0.0349
Prior OEF/OIF Deployment	-4.0433	1.6594	-2.44	0.015	-0.1095
Time 2 DRRI Combat Scale Score	0.1713	0.0455	3.76	0.000	0.1769
Time 1 BDI-II Score	0.3099	0.0856	3.62	0.000	0.2524
Time 1 PCL-M Score	0.1565	0.0597	2.62	0.009	0.1861
Constant	-0.8351	2.122	-0.38	0.706	0

R-Square = 0.2528; Adj R-Square = 0.2359

Table 31. Determinants of PTSD symptoms at Time 2 in NG veterans – job concerns, change in concerns, demographics, combat and prior symptoms

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.4911	0.2068	2.38	0.018	0.1100
Change in Job Concerns (Time 2-Time 1)	0.5670	0.1833	3.09	0.002	0.1399
Gender	-7.7592	1.8560	-4.18	<0.000	-0.1838
Marital Status	1.9837	1.2425	1.60	0.111	0.0708
Military Rank	1.0508	1.9225	0.55	0.585	0.0236
Prior OEF/OIF Deployment	-6.0370	2.2723	-2.22	0.027	-0.0947
Time 2 DRRI Combat Scale Score	0.6003	0.0747	8.04	<0.000	0.3592
Time 1 BDI-II Score	0.1308	0.1395	0.94	0.349	0.0624
Time 1 PCL-M Score	0.4053	0.0976	4.15	<0.000	0.2801
Constant	7.3900	3.6194	2.04	0.042	0

R-Square = 0.3166; Adj R-Square = 0.3013

Table 32. Determinants of depression symptoms at Time 2 in NG veterans – job concerns, change in concerns, demographics, combat, prior symptoms and other covariates

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.1051	0.1106	0.95	0.343	0.0406
Change in Job Concerns (Time 2-Time 1)	0.1812	0.0977	1.85	0.065	0.0755
Gender	-2.7489	0.9842	-2.79	0.006	-0.1125
Marital Status	1.5616	0.6707	2.33	0.020	0.0955
Military Rank	-1.1899	1.0556	-1.13	0.260	-0.0448
Prior OEF/OIF Deployment	-3.9946	1.4467	-2.76	0.006	-0.1094
Time 2 DRRI Unit Support Scale Score	-0.0831	0.0296	-2.81	0.005	-0.1145
Time 2 DRRI Combat Scale Score	0.1260	0.0411	3.07	0.002	0.1301
Time 1 BDI-II Score	0.2152	0.0754	2.85	0.005	0.1760
Time 1 PCL-M Score	0.0950	0.0527	1.80	0.072	0.1126
Time 2 Mental Health Service Use	1.4582	06815	2.14	0.033	0.0845
Time 2 DRRI Social Support Scale Score	-0.3160	0.0412	-7.68	<0.000	-0.3246
Time 2 DRRI Stressors Scale Score	1.1119	0.2409	4.62	<0.000	0.1927
Constant	24.2560	3.2364	7.49	<0.000	0

R-Square = 0.4551; Adj R-Square = 0.4366

Table 33. Determinants of PTSD symptoms at Time 2 in NG veterans – job concerns, change in concerns, demographics, combat, prior symptoms and other covariates

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.2377	0.1825	1.30	0.193	0.0538
Change in Job Concerns (Time 2-Time 1)	0.3786	0.1614	2.35	0.020	0.0948
Gender	-7.1598	1.6175	-4.43	<0.000	-0.1726
Marital Status	0.9649	1.1046	0.87	0.383	0.0346
Military Rank	1.3498	1.7228	0.78	0.434	0.0300
Prior OEF/OIF Deployment	-5.8952	2.3933	-2.46	0.014	-0.0942
Time 2 DRRI Unit Support Scale Score	-0.0210	0.0485	-0.43	0.665	-0.0170
Time 2 DRRI Combat Scale Score	0.5021	0.0680	7.39	<0.000	0.3208
Time 1 BDI-II Score	-0.0633	0.1239	-0.51	0.610	-0.0306
Time 1 PCL-M Score	0.3402	0.0868	3.92	0.000	0.2362
Time 2 Mental Health Service Use	3.8063	1.1235	3.39	0.001	0.1291
Time 2 DRRI Social Support Scale Score	-0.6260	0.0676	-9.26	<0.000	-0.3772
Time 2 DRRI Stressors Scale Score	0.8049	0.3851	2.09	0.037	0.0837
Constant	50.6137	5.3392	9.48	<0.000	0

R-Square = 0.4851; Adj R-Square = 0.4678

Table 34. Determinants of depression symptoms at Time 3 in NG veterans – job concerns, change in concerns, demographics and combat

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.6501	0.1718	3.78	0.000	0.2213
Change in Job Concerns (Time 2-Time 1)	0.0761	0.1586	0.48	0.632	0.0286
Gender	-3.6973	1.5972	-2.31	0.021	-0.1305
Marital Status	0.2547	1.0486	0.24	0.808	0.0137
Military Rank	-0.0075	1.5629	-0.00	0.996	-0.0003
Prior OEF/OIF Deployment	1.9199	2.5058	0.77	0.444	0.0424
Time 2 DRRI Combat Scale Score	0.2179	0.0686	3.18	0.002	0.1805
Constant	2.1861	2.9494	0.74	0.459	0

R-Square = 0.0903; Adj R-Square = 0.0698

Table 35. Determinants of PTSD symptoms at Time 3 in NG veterans – job concerns, change in concerns, demographics and combat

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	1.0695	0.2592	4.13	<0.000	0.2297
Change in Job Concerns (Time 2-Time 1)	0.0543	0.2394	0.23	0.821	0.0129
Gender	-7.0071	2.4096	-2.91	0.004	-0.1558
Marital Status	0.6846	1.5803	0.43	0.665	0.0233
Military Rank	2.5564	2.3590	1.08	0.279	0.0587
Prior OEF/OIF Deployment	2.1860	3.7818	0.58	0.564	0.0304
Time 2 DRRI Combat Scale Score	0.6127	0.1037	5.91	<0.000	0.3192
Constant	12.4859	4.4524	2.80	0.005	0

R-Square = 0.1747; Adj R-Square = 0.1562

Table 36. Determinants of depression symptoms at Time 3 in NG veterans – job concerns, change in concerns, demographics, combat and prior symptoms

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.1759	0.1431	1.23	0.220	0.0599
Change in Job Concerns (Time 2-Time 1)	-0.1584	0.1288	-1.23	0.220	-0.0597
Gender	0.2504	1.3272	0.19	0.851	0.0089
Marital Status	-0.0943	0.8503	-0.11	0.912	-0.0051
Military Rank	-0.4674	1.2755	-0.37	0.714	-0.0169
Prior OEF/OIF Deployment	0.1716	2.0184	0.09	0.932	0.0038
Time 2 DRRI Combat Scale Score	0.0201	0.0597	0.34	1.737	0.0167
Time 2 BDI-II Score	0.5189	0.0783	6.62	<0.000	0.4529
Time 2 PCL-M Score	0.1451	0.0502	2.89	0.004	0.2096
Constant	-0.7586	2.4579	-0.31	0.758	0

R-Square = 0.4154; Adj R-Square = 0.3982

Table 37. Determinants of PTSD symptoms at Time 3 in NG veterans – job concerns, change in concerns, demographics, combat and prior symptoms

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.4064	0.2194	1.85	0.065	0.0872
Change in Job Concerns (Time 2-Time 1)	-0.2705	0.1972	-1.37	0.171	-0.0641
Gender	-0.3757	2.0323	-0.18	0.853	-0.0084
Marital Status	0.3769	1.3013	0.29	0.772	0.0128
Military Rank	1.0639	1.9533	0.54	0.586	0.0243
Prior OEF/OIF Deployment	-0.4290	3.0895	-0.14	0.890	-0.0060
Time 2 DRRI Combat Scale Score	0.2061	0.0916	2.25	0.025	0.1077
Time 2 BDI-II Score	0.1723	0.1199	1.44	0.152	0.0948
Time 2 PCL-M Score	0.5793	0.0768	7.54	<0.000	0.5278
Constant	4.0419	3.7610	1.07	0.283	0

R-Square = 0.4576; Adj R-Square = 0.4417

Table 38. Determinants of depression symptoms at Time 3 in NG veterans – job concerns, change in concerns, demographics, combat, prior symptoms and other covariates

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.0723	0.1361	0.53	0.596	0.0246
Change in Job Concerns (Time 2-Time 1)	-0.1949	0.1215	-1.60	0.110	-0.0736
Gender	-0.2373	1.2538	-0.19	0.850	-0.0084
Marital Status	-0.1526	0.8051	-0.19	0.850	-0.0082
Military Rank	-0.6459	1.2127	-0.53	0.595	-0.0235
Prior OEF/OIF Deployment	0.1333	1.9121	0.07	0.945	0.0030
Time 2 DRRI Unit Support Scale Score	0.0434	0.0375	1.16	0.248	0.0529
Time 2 DRRI Combat Scale Score	-0.0081	0.0572	-0.14	0.887	-0.0068
Time 2 BDI-II Score	0.4511	0.0761	5.93	<0.000	0.3935
Time 2 PCL-M Score	0.0572	0.0495	1.16	0.248	0.0825
Time 3 Mental Health Service Use	2.7006	0.8885	3.04	0.003	0.1435
Time 3 DRRI Social Support Scale Score	-0.1770	0.0475	-3.72	0.000	-0.1810
Time 3 DRRI Stressors Scale Score	0.7506	0.2095	3.58	0.000	0.1664
Constant	10.7415	4.0025	2.68	0.008	0

R-Square = 0.4965; Adj R-Square = 0.4746

Table 39. Determinants of PTSD symptoms at Time 3 in NG veterans – job concerns, change in concerns, demographics, combat, prior symptoms and other covariates

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.2126	0.1985	1.07	0.285	0.0457
Change in Job Concerns (Time 2-Time 1)	-0.3453	0.1770	-1.95	0.052	-0.0823
Gender	-1.1940	1.8250	-0.65	0.514	-0.0268
Marital Status	0.3738	1.1737	0.32	0.750	0.0127
Military Rank	0.5831	1.7658	0.33	0.742	0.0134
Prior OEF/OIF Deployment	-0.4293	2.7838	-0.15	0.878	-0.0060
Time 2 DRRI Unit Support Scale Score	0.0405	0.0540	0.75	0.454	0.0313
Time 2 DRRI Combat Scale Score	0.1617	0.0833	1.94	0.053	0.0848
Time 2 BDI-II Score	0.0436	0.1107	0.39	0.694	0.0241
Time 2 PCL-M Score	0.4100	0.0720	5.69	<0.000	0.3740
Time 3 Mental Health Service Use	5.0043	1.2961	3.86	0.000	0.1678
Time 3 DRRI Social Support Scale Score	-0.3017	0.0691	-4.36	<0.000	-0.1948
Time 3 DRRI Stressors Scale Score	1.5633	0.3041	5.14	<0.000	0.2189
Constant	25.0529	5.8417	4.29	<0.000	0

R-Square = 0.5752; Adj R-Square = 0.5568

Table 40. Determinants of depression symptoms at Time 4 in NG veterans – job concerns, change in concerns, demographics and combat

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.5445	0.1978	2.75	0.006	0.1680
Change in Job Concerns (Time 2-Time 1)	0.0427	0.1871	0.23	0.820	0.0143
Gender	-4.5442	1.7564	-2.59	0.010	-0.1549
Marital Status	-0.2596	1.2116	-0.21	0.831	-0.0129
Military Rank	1.1314	1.6907	0.67	0.504	0.0406
Prior OEF/OIF Deployment	5.2258	2.8795	1.80	0.072	0.1067
Time 2 DRRI Combat Scale Score	0.3638	0.0805	4.52	<0.000	0.2736
Constant	-0.4528	3.2826	-0.14	0.890	0

R-Square = 0.1401; Adj R-Square = 0.1173

Table 41. Determinants of PTSD symptoms at Time 4 in NG veterans – job concerns, change in concerns, demographics and combat

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.9868	0.3020	3.27	0.001	0.1940
Change in Job Concerns (Time 2-Time 1)	0.1533	0.2863	0.54	0.593	0.0326
Gender	-3.9419	2.6907	-1.47	0.144	-0.0854
Marital Status	0.5854	1.8520	0.32	0.752	0.0185
Military Rank	2.6992	2.5912	1.04	0.299	0.0616
Prior OEF/OIF Deployment	4.1897	4.4382	0.94	0.346	0.0543
Time 2 DRRI Combat Scale Score	0.7370	0.1226	6.01	<0.000	0.3545
Constant	6.7513	5.0260	1.34	0.180	0

R-Square = 0.1788; Adj R-Square = 0.1572

Table 42. Determinants of depression symptoms at Time 4 in NG veterans – job concerns, change in concerns, demographics, combat and prior symptoms

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	-0.1381	0.1426	-0.97	0.334	-0.0425
Change in Job Concerns (Time 2-Time 1)	-0.0213	0.1267	-0.17	0.866	-0.0073
Gender	-1.3637	1.2570	-1.08	0.279	-0.0458
Marital Status	0.0281	0.8497	0.03	0.974	0.0014
Military Rank	1.5249	1.1599	1.31	0.190	0.0555
Prior OEF/OIF Deployment	4.0726	1.9355	2.10	0.036	0.0865
Time 2 DRRI Combat Scale Score	0.1117	0.0597	1.87	0.063	0.0826
Time 3 BDI-II Score	0.6516	0.0742	8.79	<0.000	0.6028
Time 3 PCL-M Score	0.1276	0.0504	2.53	0.012	0.1806
Constant	-2.3427	2.3698	-0.99	0.324	0

R-Square = 0.6303; Adj R-Square = 0.6163

Table 43. Determinants of PTSD symptoms at Time 4 in NG veterans – job concerns, change in concerns, demographics, combat and prior symptoms

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.0207	0.2001	0.10	0.918	0.0041
Change in Job Concerns (Time 2-Time 1)	0.1071	0.1782	0.60	0.548	0.0237
Gender	1.4551	1.7701	0.82	0.412	0.0314
Marital Status	0.5232	1.1938	0.44	0.662	0.0166
Military Rank	1.8249	1.6342	1.12	0.265	0.0427
Prior OEF/OIF Deployment	2.5898	2.7255	0.95	0.343	0.0353
Time 2 DRRI Combat Scale Score	0.2100	0.0838	2.51	0.013	0.1005
Time 3 BDI-II Score	0.2151	0.1043	2.06	0.040	0.1278
Time 3 PCL-M Score	0.7511	0.0708	10.61	<0.000	0.6851
Constant	-3.1519	3.3315	-0.95	0.345	0

R-Square = 0.6946; Adj R-Square = 0.68

Table 44. Determinants of depression symptoms at Time 4 in NG veterans – job concerns, change in concerns, demographics, combat, prior symptoms and other covariates

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	-0.2495	0.1323	-1.89	0.061	-0.0769
Change in Job Concerns (Time 2-Time 1)	-0.1338	0.1166	-1.15	0.253	-0.0464
Gender	-1.8072	1.1517	-1.57	0.118	-0.0612
Marital Status	0.8337	0.7871	1.06	0.291	0.0412
Military Rank	1.6372	1.0632	1.54	0.125	0.0600
Prior OEF/OIF Deployment	2.9573	1.7973	1.65	0.101	0.0633
Time 2 DRRI Unit Support Scale Score	-0.0247	0.0361	-0.68	0.495	-0.0265
Time 2 DRRI Combat Scale Score	0.1125	0.0554	2.03	0.043	0.0835
Time 3 BDI-II Score	0.5752	0.0693	8.30	<0.000	0.5343
Time 3 PCL-M Score	0.0394	0.0496	0.79	0.428	0.0559
Time 4 Mental Health Service Use	1.6422	0.8799	1.87	0.063	0.0808
Time 4 DRRI Social Support Scale Score	-0.2359	0.0447	-5.28	<0.000	-0.2453
Time 4 DRRI Stressors Scale Score	0.3622	0.2270	1.60	0.112	0.0667
Constant	15.7193	3.9597	3.97	<0.000	0

R-Square = 0.6986; Adj R-Square = 0.6816

Table 45. Determinants of PTSD symptoms at Time 4 in NG veterans – job concerns, change in concerns, demographics, combat, prior symptoms and other covariates

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**	**Beta Coefficient**
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	-0.1418	0.1913	-0.74	0.459	-0.0281
Change in Job Concerns (Time 2-Time 1)	-0.0416	0.1691	-0.25	0.806	-0.0092
Gender	0.9017	1.6705	0.54	0.590	-0.0196
Marital Status	1.5417	1.1386	1.35	0.177	0.0490
Military Rank	2.3154	1.5427	1.50	0.135	0.0544
Prior OEF/OIF Deployment	1.9871	2.6070	0.76	0.447	0.0272
Time 2 DRRI Unit Support Scale Score	-0.0036	0.0521	-0.07	0.944	-0.0025
Time 2 DRRI Combat Scale Score	0.2040	0.0802	2.54	0.012	0.0976
Time 3 BDI-II Score	0.1546	0.1003	1.54	0.125	0.0920
Time 3 PCL-M Score	0.5992	0.0717	8.36	<0.000	0.5457
Time 4 Mental Health Service Use	3.7895	1.2693	2.99	0.003	0.1198
Time 4 DRRI Social Support Scale Score	-0.2327	0.0647	-3.60	0.000	-0.1556
Time 4 DRRI Stressors Scale Score	0.7375	0.3280	2.25	0.026	0.0871
Constant	14.6679	5.7332	2.56	0.011	0

R-Square = 0.7374; Adj R-Square = 0.7227

Table 46. Effects of job change on PTSD symptoms at Time 3

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**
Different Job (vs. Same Job)	1.8305	2.2527	0.81	0.418
Pre vs. Post Time Period	-9.4533	1.3977	-6.76	<0.000
DiffJob*PrePost	-1.6304	2.4552	-0.66	0.508
Gender	-6.8486	2.0700	-3.31	0.001
Military Rank	0.9242	1.6827	0.55	0.584
Prior OEF/OIF Deployment	10.4377	3.3697	3.10	0.002
Time 2 DRRI Combat Scale Score	0.2900	0.0822	3.53	0.001
Deployment-Related Injury	2.0678	1.2612	1.64	0.103
In School at Time 3	3.4904	1.5120	2.31	0.022
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.7989	0.2042	3.91	0.000
Change in Job Concerns (Time 2-Time 1)	-0.2251	0.1987	-1.13	0.259
Constant	23.4295	3.6721	6.38	<0.000

Table 46a. Effects of job change on PTSD symptoms at Time 3 – estimates for DD model

	Estimate	**Standard Error**	***t***	***P*** **> |t|**
Change in PCL (Different Job), Pre - Post	-11.0837	2.0185	-5.49	<0.000
Change in PCL (Same Job), Pre - Post	-9.4533	1.3977	-6.76	<0.000
Diff of Diff	-1.6304	2.4552	-0.66	0.508

Table 47. Effects of job change on depression symptoms at Time 3

	Coefficient	**Standard Error**	***t***	***P*** **> |t|**
Different Job (vs. Same Job)	2.2344	1.4169	1.58	0.117
Pre vs. Post Time Period	-4.8439	0.8197	-5.91	<0.000
DiffJob*PrePost	-1.8122	1.4353	-1.26	0.209
Gender	-7.0860	1.4973	-4.73	<0.000
Military Rank	0.6354	1.2171	0.52	0.602
Prior OEF/OIF Deployment	8.0240	2.4289	3.30	0.001
Time 2 DRRI Combat Scale Score	0.0522	0.0595	0.88	0.381
Deployment-Related Injury	0.7147	0.9134	0.78	0.435
In School at Time 3	1.4152	1.094	1.29	0.198
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.4442	0.1477	3.01	0.003
Change in Job Concerns (Time 2-Time 1)	0.0257	0.1437	0.18	0.858
Constant	9.9230	2.6160	3.79	0.000

Table 47a. Effects of job change on depression symptoms at Time 3 – estimates for DD model

	Estimate	**Standard Error**	***t***	***P*** **> |t|**
Change in BDI-II (Different Job), Pre - Post	-6.6561	1.1782	-5.65	<0.000
Change in BDI-II (Same Job), Pre - Post	-4.8439	0.8197	-5.91	<0.000
Diff of Diff	-1.8122	1.4353	-1.26	0.209

Table 48. Effects of job change on PTSD symptoms at Time 4

	Coefficient	**Standard Error**	***t***	***P* > |t|**
Different Job (vs. Same Job)	2.7357	2.6556	1.03	0.305
Pre vs. Post Time Period	-8.5670	1.6255	-5.27	<0.000
DiffJob*PrePost	-2.7156	2.8660	-0.95	0.345
Gender	-6.2567	2.1637	-2.89	0.005
Military Rank	0.2285	1.8176	0.13	0.900
Prior OEF/OIF Deployment	11.1893	3.7107	3.02	0.003
Time 2 DRRI Combat Scale Score	0.3593	0.0935	3.84	0.000
Deployment-Related Injury	1.3771	1.4312	0.96	0.338
In School at Time 3	4.0862	1.6545	2.47	0.015
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.7693	0.2350	3.27	0.001
Change in Job Concerns (Time 2-Time 1)	-0.3115	0.2250	-1.38	0.169
Constant	21.1807	3.9840	5.32	<0.000

Table 48a. Effects of job change on PTSD symptoms at Time 4 – estimates for DD model

	Estimate	**Standard Error**	***t***	***P* > |t|**
Change in PCL (Different Job), Pre - Post	-11.2826	2.3604	-4.78	<0.000
Change in PCL (Same Job), Pre - Post	-8.5670	1.6255	-5.27	<0.000
Diff of Diff	-2.7156	-2.7156	-0.95	0.345

Table 49. Effects of job change on depression symptoms at Time 4

	Coefficient	**Standard Error**	***t***	***P* > |t|**
Different Job (vs. Same Job)	2.7907	1.5824	1.76	0.080
Pre vs. Post Time Period	-4.3122	0.9704	-4.44	<0.000
DiffJob*PrePost	-2.3834	1.7082	-1.40	0.165
Gender	-6.8451	1.5524	-4.41	<0.000
Military Rank	1.1258	1.3041	0.86	0.390
Prior OEF/OIF Deployment	10.3170	2.6598	3.88	0.000
Time 2 DRRI Combat Scale Score	0.1081	0.0671	1.61	0.109
Deployment-Related Injury	0.3271	1.0279	0.32	0.751
In School at Time 3	1.3895	1.1870	1.17	0.244
Time 1 Modified DRRI Disruptions Scale Score (Job Concerns)	0.4084	0.1685	2.42	0.017
Change in Job Concerns (Time 2-Time 1)	-0.0139	0.1615	-0.09	0.931
Constant	7.7791	2.7924	2.79	0.006

Table 49a. Effects of job change on depression symptoms at Time 4 – estimates for DD model

	Estimate	**Standard Error**	***t***	***P* > |t|**
Change in BDI-II (Different Job), Pre - Post	-6.6957	1.4058	-4.76	<0.000
Change in BDI-II (Same Job), Pre - Post	-4.3122	0.9704	-4.44	<0.000
Diff of Diff	-2.3834	1.7082	-1.40	0.165

Chapter 5: The effects of post-deployment civilian job stress and job support on mental health symptoms in National Guard veterans returning from Iraq

Objectives: A key feature of the civilian reintegration process for National Guard and Reserve (NGR) veterans is the transition away from and back to civilian employment. Issues related to employment, namely levels of perceived job stress and job support from supervisors and co-workers upon return to civilian work, may be important risk factors in the development of post-deployment mental health symptoms. We hypothesized, after accounting for important deployment-related and post-deployment variables (including stressful life events and social support), that job stress and job support would be uniquely associated with symptoms of PTSD and depression at two years post-deployment in a sample of NG veterans.

Methods: We utilized prospective, longitudinal data from the Readiness and Resilience in National Guard Soldiers (RINGS) study, a study of risk and protective factors associated with post-deployment functioning. Pre-deployment data was collected in a cohort of 522 National Guard soldiers from a single brigade one month prior to deployment to Iraq (Time 1). Troops were deployed from March 2006 to July 2007. Post-deployment data was collected by mailed self-report questionnaires 2-3 months after brigade return (Time 2), and again approximately one and two years later (Times 3 and 4). A smaller occupational cohort completed two additional interviews following completion of the Time 2 and Time 3 mailed questionnaires; a total of 355 completed an interview after Time 2 that gathered information on pre-deployment work history and current occupational status. Of those, 297 (84%) completed a second interview on occupational functioning after completing the mailed questionnaire at Time 3, and 208 (59%) completed the final mailed questionnaire at Time 4. Job stress and job support (i.e., supervisor and coworker support) were assessed at the Time 3 telephone interviews. Participants for the present analyses were those who completed all four waves of self-report questionnaires (Times 1-4), occupationally-focused interviews at Times 2 and 3, and who were employed at Time 3 (n = 169). Linear regression models were employed to examine the effects of job stress and job support on continuous measures of symptoms of depression and PTSD at Time 4. Guided by research findings on later onset of symptom development in some combat veterans, two sets of regression models were run predicting symptoms of depression and PTSD; the first set with the full sample and a second set with a subgroup of veterans without a positive screen for symptoms of depression or PTSD at Time 2. Beta coefficients were assessed to gauge changes in relative importance.

Results: In the full sample depression model predicting symptoms at Time 4, perceived job stress and coworker support were significant predictors after controlling for a number of other important covariates including stressful life events. Neither job stress nor job support was a significant predictor of symptoms in the full sample PTSD model. In the subgroup models for depression and PTSD, perceived job stress was a significant predictor of symptoms in both models whereas the job support measures were not significant. Based on the beta coefficients, the relative importance of perceived job stress increased from the full sample models to the subgroup models for both PTSD and depression.

Conclusions: NGR veterans face unique challenges post-deployment as their military service is relatively part-time and they retain commitments to civilian jobs despite involvement in protracted or multiple deployments. We've shown that perceived job stress and poor coworker support contribute to symptoms of depression in NG veterans over two years after returning from Iraq. Job stress may also contribute to an increase in symptoms of PTSD in some NG veterans. It is possible that job stress represents a more specific domain of a broader construct encompassing stressful life events that has special salience for NG veterans.

Introduction

Civilian reintegration is the process of military personnel transitioning back into personal and organizational roles and society following deployment. The body of literature on reintegration is limited but growing as the current conflicts continue in the Middle East. As service members return home, our newest generation of veterans from Iraq (Operation Iraqi Freedom; OIF and Operation New Dawn; OND) and Afghanistan (Operation Enduring Freedom; OEF) are faced with the task of reintegrating into potentially disrupted family, social, and occupational roles (Sayer et al. 2010; Milliken et al. 2007; Seal et al. 2009).

Depending on individual circumstances, the period of reintegration can be a difficult time for many returning service members. In a national survey conducted in 2008 of OEF/OIF combat veterans who had used Department of Veterans Affairs (VA) medical services, 40% reported some to extreme overall difficulty in readjusting to civilian life across a number of domains including social functioning, productivity, community involvement, and self-care (Sayer et al. 2010). Civilian reintegration may be particularly challenging for National Guard and Reserve (NGR) component service members. Unlike regular active duty (AD) component service members, NGR troops are typically leaving civilian roles (family and employment) and are more likely to deploy with unfamiliar units (Griffith 2011). Older NGR service members are likely well established in civilian occupations prior to deploying (Seal et al. 2009). Following deployment, NGR troops face unique reintegration challenges as they transition from warfighter back to civilian roles.

Post-deployment mental health problems (i.e., post-traumatic stress disorder; PTSD, depression, and alcohol or drug problems) may complicate the reintegration process. Military personnel returning from combat deployments in Iraq and Afghanistan are at increased risk of mental health problems (U.S. Army Surgeon General 2005; Hotopf et al. 2006; Browne et al. 2007; Milliken et al. 2007; Smith et al. 2008; Seal et al. 2009; Iverson et al. 2009). The heightened risk of mental health problems among veterans appears to increase even more in the months and years following combat deployment suggesting that experiences outside of deployment itself contribute to risk (Wolfe et al. 1999; Milliken et al. 2007; Seal et al. 2009). In a study examining trends and risk factors for mental health diagnoses among 289,328 OEF/OIF veterans entering Veterans Affairs (VA) health care from 2002 to 2008, Seal et al. (2009) found that the prevalence of mental health diagnoses increased linearly with increasing length of time in the VA health care system from one to four years. In addition, several reports indicate that risk is greater in NGR troops compared with regular AD troops (Hotopf et al. 2006; Browne et al. 2007; Milliken et al. 2007). For example, Milliken and colleagues (2007) found positive screening rates for PTSD and depression more than doubled among NGR service members from an immediate post-deployment screening to a re-evaluation six months later, from 12.7% to 24.5% for PTSD and from 3.8% to 13% for depression. This was in contrast to much smaller increases for regular AD service members during the same time-frame, from 11.8% to 16.7% for PTSD and from 4.7% to 10.3% for depression (Milliken et al. 2007).

For NGR troops whose military service is relatively part-time and who retain commitments to civilian jobs, despite involvement in protracted or multiple deployments,

a key feature of the reintegration process is the transition back to civilian employment. For veterans with diagnosed mental health problems, the effects of mental health problems on employment status and/or occupational functioning have been established first in Vietnam-era veterans, and more recently in OEF/OIF veterans as they reintegrate. For Vietnam-era veterans, Savoca and Rosenheck (2000) found that a lifetime diagnosis of PTSD was associated with a nearly 50% lower probability of current employment more than 20 years after the end of the Vietnam War. Effects on employment rates were nearly as large for major depression and anxiety disorders. PTSD and depression were also associated with large decreases in hourly wage rates, 16% and 45%, respectively, in Vietnam-era veterans. In another study of 325 Vietnam-era veterans receiving treatment for PTSD, veterans with more severe PTSD symptoms were more likely to work part-time or not at all compared with veterans with less severe symptoms (Smith et al. 2005). Two recent studies using samples of OEF/OIF veterans have similarly found associations between mental health problems and occupational functioning (Adler et al. 2011; Erbes et al. 2011). In a cross-sectional analysis of 473 employed OEF/OIF veterans from six VA medical centers who were referred for psychiatric assessment, Adler et al. (2011) found significant work impairment across a number of domains on the Work Limitations Questionnaire (WLQ). Work impairment was associated with major depressive disorder, PTSD, generalized anxiety or panic disorder, alcohol dependence, and illicit drug use. Erbes et al. (2011), utilizing a sample of 262 NGR service members deployed to OIF, found no association between presence of mental health problems and employment status, but did find lower levels of work role functioning in veterans with diagnoses of PTSD, depression, and/or alcohol abuse or dependence, and greater rates of deterioration

over time in functioning in service members with a diagnosis of PTSD. Clearly where mental health problems exist, they impact a veteran's ability to work and function optimally upon reintegration.

However, for a number of combat veterans, mental health problems do not develop for several months or years following deployment (Wolfe et al. 1999; Milliken et al. 2007; Seal et al. 2009). For these veterans, we hypothesize that the strains and stressors experienced during the transition to civilian life, specifically to civilian employment, are associated with the development of post-deployment mental health symptoms and problems. Riviere et al. (2011) published the first study specifically designed to address whether issues salient to OEF/OIF NGR veterans were risk factors for developing PTSD and depression post-deployment. Utilizing a cross-sectional design, they examined the role of four NG-specific variables on PTSD and depression at three and 12 months post-deployment adjusting for demographic variables and combat exposure. A sample of over 4,000 NG soldiers from two brigades was surveyed at the two time points following their first deployment to Iraq; different soldiers were surveyed at each time point. The NG-specific variables included: self-reported financial hardship, job loss, employer support for military affiliation, and a variable indicating whether or not veterans believed their deployment had negatively affected coworkers at their civilian jobs in their absence. Results from the multivariate analyses indicated that all of the variables were associated with one or both of the mental health outcomes evaluated at one or both of the time points. These NG-specific variables were found to be risk factors for developing mental health problems conferring additional risk beyond combat exposure. A limitation of this study was the lack of a longitudinal design which did not

allow them to assess whether depression or PTSD preceded or were consequences of the NG-specific stressors.

Like Riviere et al. (2011), we believe there are civilian reintegration issues related to employment uniquely experienced by NGR service members, namely levels of perceived job stress and job support from supervisors and co-workers upon return to civilian work that may be particularly important risk factors in the development of post-deployment mental health symptoms and problems. For the purposes of our work, job stress is defined as the perceived harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources, and needs of the worker. Job support is defined as the extent to which employees perceive their supervisors and fellow co-workers value their contributions and care about their well-being. The theory underlying our analyses is Pearlin's theory of stress (Pearlin 1989). According to this theory of stress (Pearlin 1989), life events (i.e., deployment) and chronic strains (i.e., employment factors such as job stress and poor supervisor and/or coworker relationships) converge in the lives of returning veterans to create stressful life conditions which subsequently can result in the development of post-deployment mental health problems. Chronic strains and stressors, as opposed to acute, life-threatening events (i.e., combat exposure), are ongoing and may gradually erode people's coping resources taxing their mental health. According to Miller and Rasmussen (2010), these effects likely continue being felt with the passing of time.

The literature supports more broadly the role of stressful life events and low social support in the development of both PTSD and depression. It is possible that job stress and job support represent more specific domains of these broader constructs and

have special salience for NGR service members. Low social support and stressful life events were among the risk factors identified in a comprehensive model of major depression in men (Kendler et al. 2006). Likewise, in a meta-analysis of risk factors for PTSD in trauma-exposed adults, lack of social support and higher levels of life stress were identified as important risk factors in civilian and military populations, with life stress relatively more important in the civilian population (Brewin et al. 2000). These factors operating after trauma exposure had somewhat stronger effect than pre-trauma factors. Most recently, in a sample of NGR service members deployed to OIF, Polusny et al. (2011) found that lack of post-deployment social support and experiencing a greater number of recent stressful life events were both associated with new-onset PTSD after controlling for combat exposure, findings consistent with other studies in military populations (Benotsch et al. 2000; Browne et al. 2007).

Extending upon the work of Riviere et al. (2011) by examining NG-specific variables utilizing a longitudinal design, our goals were to examine the role of job stress and job support in the development of symptoms of PTSD and depression in a cohort of NGR service members who completed a 16-month deployment in Iraq. We hypothesized that job support and job stress would be uniquely associated with symptoms of PTSD and depression at two years post-deployment.

Methods

Data Collection

We utilized prospective, longitudinal data to examine the transition back to civilian employment and its effects on post-deployment mental health symptoms in a cohort of NGR veterans. The data were gathered as part of the Readiness and Resilience

in National Guard Soldiers (RINGS) study, a study of risk and protective factors associated with post-deployment functioning (see Polusny et al. 2011 for details). Pre-deployment data was collected in a cohort of 522 National Guard soldiers from a Brigade Combat Team one month prior to deployment to Iraq (Time 1). Troops were deployed from March 2006 to July 2007. Post-deployment data was collected by mailed self-report questionnaires 2-3 months after the brigade returned from deployment (Time 2), and again approximately one and two years later (Times 3 and 4).

As illustrated in Figure 3 (see Chapter 3), a total of 424 veterans (81% of the original cohort) completed Time 2 questionnaires. Of those, a total of 355 completed an additional Time 2 interview that gathered information on pre-deployment work history and current occupational status. Of this cohort, 297 (response rate = 84%) completed a second interview on occupational functioning by telephone after completing the mailed questionnaire at Time 3, and 208 (59%) completed the final mailed questionnaire at Time 4. The exposures of interest – job stress and job support (i.e., supervisor and coworker support) – were assessed at the Time 3 telephone interviews. Participants for the present analyses were those who completed all four waves of self-report questionnaires (Times 1 through 4), occupationally-focused interviews at Times 2 and 3, and who were employed at Time 3 (n = 169).

All participants provided written informed consent to take part in the RINGS study. Study protocols were reviewed and approved by the Institutional Review Boards of the Minneapolis VA Health Care System, University of Minnesota, and the Department of Defense.

Measures

Main Dependent Variables of Interest

PTSD Checklist – Military Version (PCL-M) (Weathers et al. 1993; Blanchard et al. 1996). The PCL-M is a 17-item self-report scale that assesses each of the symptoms of PTSD experienced in the past month using a Likert-type response format from 1 to 5 as they relate to a participant's military experiences. The PCL-M is widely used in military population studies and has high overall convergent validity and test-retest reliability. The PCL-M correlates highly with other interview and self-report measures of PTSD (Blanchard et al. 1996). Participants completed the PCL-M at Times 1-4. A positive screen for symptoms of PTSD was defined as a total PCL-M score ≥ 50 and endorsement of at least one intrusion symptom, three avoidance symptoms, and two hyperarousal symptoms each at least at the moderate level (Hoge et al. 2004).

Beck Depression Inventory-II (BDI-II) (Beck et al. 1996). The BDI-II is a 21-item self-report measure of the severity of depression symptoms. The BDI-II is widely used in both clinical and non-clinical populations, and has established internal consistency and test-retest reliability (Dozois et al. 1998). Respondents are asked to rate on a 4-point scale (0-3) how often they have experienced each item in the past two weeks. A total score of 0-13 is considered minimal range, 14-19 is mild, 20-28 is moderate, and 29-63 is severe. The recommended threshold score on the BDI-II is 20 with those scoring ≥ 20 classified as experiencing symptoms of depression. Participants completed the BDI-II at Times 1-4.

Exposures of Interest

Supervisor and Coworker Support. Taken from Bond et al. (1991), two items asked the following: 1) "My supervisor understands when I need time off to take care of personal matters," and 2) "My coworkers understand when I need time off to take care of personal

matters." Response options ranged on Likert scales from 1 = strongly agree to 5 = strongly disagree. Supervisor and coworker support were modeled as dichotomous variables with a response of 4 or 5 on either measure representing poor support.

Job Stress. Taken from Mårdberg et al. (1991)'s measure of perceived total workload, two items asked the following: 1) "How often do you feel you have too much to do at your MAIN paid job or business?" and 2) "How often do you experience stress due to your MAIN paid job or business?" Response options included: 1 = never, 2 = rarely, 3 = sometimes, 4 = usually, and 5 = almost always. The two measures of job stress were combined and modeled as a single continuous variable with a minimum score of 2 indicating never having job stress and a maximum score of 10 denoting the maximum levels of job stress.

Additional Covariates

Selection of additional covariates to include in multivariate models was based on causal diagrams developed based on previous research and expert knowledge (see Figure 5; Chapter 3). The following covariates were included: gender, military rank, an indicator variable for having an OEF/OIF deployment prior to the 2006 deployment, a variable indicating whether or not any injuries were experienced during deployment, measures of combat exposure and unit cohesion during deployment, continuous measures of PTSD symptoms and depression symptoms (Time 2), Time 3 report of mental health services use since returning home from deployment, and measures of post-deployment social support and stressful life events at Time 3. The measures of combat exposure, unit cohesion, social support, and stressful life events were assessed using four valid and reliable scales from the Deployment Risk and Resilience Inventory (DRRI) including the

Combat Experiences scale, the Unit Support scale, the Post-Deployment Social Support scale, and the Post-Deployment Stressors scale, respectively (King et al. 2006; Vogt et al. 2008). Higher scores on each of these scales indicated greater levels of each construct.

Analyses

The first set of models included the full sample at Time 3. Measures of symptoms on the BDI-II for depression and the PCL-M for PTSD from the early post-deployment time period (Time 2) were included in the models to control for endogeneity; that is, for veterans already experiencing symptoms, these symptoms could affect their perceptions of job support and job stress assessed at Time 3 in addition to affecting levels of symptoms at Time 4.

A second analysis excluded any veterans with a positive screen for depression or PTSD in the early post-deployment time period (Time 2). Guided by research findings on later onset of symptom development in some combat veterans (Wolfe et al. 1999; Milliken et al. 2007; Seal et al. 2009), we decided to run two sets of regression models for the development of both symptoms of depression and PTSD; the first set with our full sample and a second with a subgroup of veterans without a positive screen for symptoms of depression or PTSD at Time 2. Our intent with the subgroup models was not to explicitly predict late onset symptom development, but rather to examine whether or not our exposures of interest had more or less salience in a group of veterans without a positive screen for symptoms of depression or PTSD at Time 2. A positive screen for symptoms of depression was defined as a total BDI-II score ≥ 20; a positive screen for symptoms of PTSD was defined as a total PCL-M score ≥ 50 and endorsement of at least one intrusion symptom, three avoidance symptoms, and two hyperarousal symptoms each

at least the moderate level (Hoge et al. 2004). Since comorbid occurrence of depression and PTSD symptoms was high in the RINGS cohort (Kehle et al. 2011), we chose to classify veterans as experiencing symptoms if they met positive screen criteria on either the BDI-II or PCL-M scales at Time 2. We ran the same set of regression models on the subgroup without a positive screen for symptoms of depression or PTSD at Time 2 as we ran on the full sample.

Linear regression models were employed to examine the effects of our exposures of interest on continuous measures of both symptoms of depression and PTSD at Time 4. All analyses were conducted using proc reg in SAS 9.2 (SAS Institute Inc., Cary, NC). In order to compare the relative importance of our exposures of interest in the full sample versus the subgroup without a positive screen for symptoms of depression or PTSD at Time 2, we examined standardized values and compared the beta coefficients across the two sets of models.

Results

Comparing our final occupational cohort subsample (n = 169) to the larger RINGS cohort (n = 522), veterans in the occupational cohort differed significantly from the larger cohort on three variables (see Table 50). Specifically, the veterans included in our analyses were significantly more likely to be married (56.8% vs. 45.4% in the RINGS cohort, p = 0.003), of higher rank (i.e. a lower proportion were of enlisted status, 82.2% vs. 90.2% in the RINGS cohort, p = 0.0005), more likely to be employed at Time 2 (68.9% vs. 57.6% in the RINGS cohort, p = 0.003). Descriptive statistics on our exposures of interest and additional covariates are given in Table 51.

Full Sample Models

In the full sample model predicting depression symptoms at Time 4, perceived job stress assessed at Time 3 was a significant predictor of depression symptoms (see Table 52), after controlling for Time 2 measures of PTSD and depression and a number of other important covariates including stressful life events (Time 3 DRRI Stressors Scale Score). The parameter estimate indicated that for every one unit increase in total job stress, veterans experienced a statistically significant increase in depression symptoms of 0.71 units. In addition, perceived coworker support was also a significant predictor in the model; the parameter estimate indicated that for veterans experiencing poor coworker support, symptoms of depression increased by 4.72 units. Perceived supervisor support was not a significant predictor of depression symptoms at Time 4 in the full sample model. The broader measures of social support (Time 3 DRRI Social Support Scale Score) and stressful life events (Time 3 DRRI Stressor Scale Score) were significant predictors in the full sample model predicting symptoms of depression, as was a prior OEF/OIF deployment, combat exposure (Time 2 DRRI Combat Scale Score), and the symptom measure of depression at Time 2.

In the full sample model predicting PTSD symptoms at Time 4, none of our exposures of interest were significant predictors of PTSD symptoms (see Table 53). The broader measures of post-deployment social support and stressful life events at Time 3 were significant predictors in the full sample model predicting symptoms of PTSD at Time 4, as were measures of unit cohesion (Time 2 DRRI Unit Support Scale Score), combat exposure, and depression symptoms at Time 2.

Subgroup Models

Next, we ran the same set of regression models on the subgroup without a positive screen for symptoms of depression or PTSD at Time 2. In the subgroup model for depression, perceived job stress assessed at Time 3 was a significant predictor of depression symptoms at Time 4 (see Table 54). The parameter estimate indicated that for every one unit increase in total job stress, veterans experienced a statistically significant increase in depression symptoms of 1.20 units. Perceived coworker support and perceived supervisor support were not significant predictors of depression symptoms at Time 4 in the subgroup model. Gender, symptoms of depression at Time 2, and the broader measure of stressful life events were also significant predictors in the subgroup model.

In the subgroup model for PTSD, perceived job stress assessed at Time 3 was a significant predictor of PTSD symptoms at Time 4 (see Table 55). The parameter estimate indicated that for every one unit increase in total job stress, veterans experienced a statistically significant increase in PTSD symptoms of 1.46 units. Perceived coworker support and perceived supervisor support were not significant predictors of PTSD symptoms at Time 4 in the subgroup model. Like the full sample model, the broader measure of social support was a significant predictor in the subgroup model predicting symptoms of PTSD, as were the measures of unit cohesion, combat exposure, and symptoms of depression at Time 2.

Full-Sample versus Subgroup Models

Considering our exposures of interest that were significant and comparing the beta coefficients from the full sample model predicting symptoms of depression (Table 52) versus the subgroup model (Table 54), we see that the relative importance of

perceived job stress increased from the full sample model to the subgroup model. A one standard deviation increase in job stress in the full sample model led to a 0.16 standard deviation increase in predicted depression symptoms, while a one standard deviation increase in job stress in the subgroup model led to a 0.30 standard deviation increase in predicted depression symptoms. Likewise, while not a significant predictor in the full sample model predicting symptoms of PTSD, perceived job stress was significant in the subgroup model and of greater relative importance compared to the full sample model. A one standard deviation increase in job stress in the full sample model led to a 0.10 standard deviation increase in predicted PTSD symptoms (Table 53), while a one standard deviation increase in job stress in the subgroup model led to a 0.24 standard deviation increase in predicted PTSD symptoms (Table 55).

Discussion

Overall, our findings support one of the initial study hypotheses; veterans experiencing more perceived job stress at 16-18 months post-deployment experience more symptoms of depression and PTSD at approximately two years post-deployment. In terms of predicting depression symptoms, these findings were consistent for both the full sample model and a subgroup model excluding veterans with a positive screen for depression or PTSD in the early post-deployment time period. However, in terms of predicting PTSD symptoms, perceived job stress was significant only in the subgroup model, and not in the full sample model. Lower levels of coworker support were of borderline significance for predicting depression symptoms in the full sample model, but not the subgroup model. Coworker support was not associated with PTSD symptoms in

either set of models. Likewise, supervisor support was not associated with symptoms of depression or PTSD at two years post-deployment in either set of models.

Our work builds upon the work of Riviere et al. (2011) as it relates to job support by including a longitudinal design, a more comprehensive research model, and a longer post-deployment follow-up time period, despite using different measures of NG-specific variables. We were able to adjust for symptoms of depression and PTSD in the early post-deployment time period, and also chose to examine a subgroup excluding veterans with a positive screen for depression or PTSD in the early post-deployment time period. We failed to find any associations between supervisor support and PTSD or depression symptoms. The measure we utilized was a single item limited to supervisor support and future investigators may wish to examine employer support more broadly including support as it relates to military affiliation.

In contrast to the Riviere et al. (2011) study, we found limited evidence that coworker support affects symptoms of depression and no evidence that it affects symptoms of PTSD. However, this is likely explained by differences in how coworker support was defined in the two studies. The variable utilized by Riviere et al. (2011) addressed whether or not veterans believed their deployment had negatively affected coworkers at their civilian jobs in their absence, while our measure assessed perceived coworker support in the post-deployment time period. One other recent study included post-deployment coworker support in a model of reintegration and affective commitment to the military and found an association between coworker support and fewer posttraumatic symptoms (Currie et al. 2011). This study of Canadian military personnel

returning from Afghanistan utilized a 4-item measure of homecoming support, which again may have been a more robust measure than the single item we utilized in our study.

Adverse relationships between job stress and mental health are well-established in civilian populations (Stansfeld and Candy 2006; Bonde 2008), in active duty military populations exposed to trauma and combat (Pflanz 2001; Pflanz and Sonnek 2002), as well as in active duty military populations involved in routine work (Pflanz and Ogle 2006; Hourani et al. 2006). However, this is the first examination of perceived job stress that we are aware of in the context of civilian reintegration of NGR veterans. We found this predictor to be more important in terms of significance than measures of job support in our occupational cohort. Access to a very rich dataset allowed us to create a relatively comprehensive research model including a number of variables that have been shown in the literature to be important predictors of both major depression and PTSD, including combat exposure, social support, and stressful life events. Even after controlling for these factors, perceived job stress was found to be significantly associated with increases in symptoms of depression, and increases in symptoms of PTSD for a subgroup of veterans without a positive screen for depression or PTSD in the early post-deployment time period. Our findings support Pearlin's theory of stress as applied to our assessment of the transition to civilian employment. Based our findings, it is possible that job stress represents a more specific domain of a broader construct encompassing stressful life events that has special salience for NGR service members.

Our results for perceived job stress also support the ideas of Miller and Rasmussen (2010). According to Miller and Rasmussen (2010), chronic strains and stressors, as opposed to acute, life-threatening events (i.e., combat exposure), gradually

erode people's coping resources taxing their mental health. Effects continue being felt with the passing of time, which was supported by the subgroup analyses we conducted. Perceived job stress increased in relative importance as a predictor of both symptoms of depression and PTSD in the subgroup analyses we conducted. The subgroup excluded veterans with a positive screen for depression or PTSD in the early post-deployment time period. A possible explanation for why job stress was significant in the subgroup model, but not in the full sample model, may be that as distress levels increase, the relative importance of job stress diminishes. That is, for veterans already experiencing high levels of distress due to symptoms of PTSD and/or depression (i.e., the veterans in the full sample model with a positive screen), what is going on the workplace has little additional consequences for them since their levels of distress are already high.

Our findings provide further support for risk factors for mental health symptoms in the post-deployment time period, which has important implications for research and practice in this special population of veterans. NGR veterans face unique challenges post-deployment as their military service is relatively part-time and they retain commitments to civilian jobs. Involvement in protracted deployments, or multiple deployments, and the transition back to civilian employment affects NGR veterans in ways that can make them vulnerable to depression and PTSD. Future research in this population is needed that could extend the work of Miller and Rasmussen (2010). In the context of civilians exposed to war, they have proposed a model in which daily stressors mediate the relationship of war exposure on mental health and also have a direct effect on mental health. Based on this model, they advocate for an integrative, sequenced approach to clinical intervention in which daily stressors are first addressed followed by specialized

interventions for those whose distress does not abate when daily stressors are lessened (Miller and Rasmussen 2010). Recognizing the unique needs and circumstances of NGR veterans, similar interventions could be developed and tested. In the interim, employers and mental health providers need to be cognizant of issues faced by NGR veterans and work to ameliorate the presence of their work-related stressors as well as other daily stressors to the extent possible.

Study limitations should be considered when interpreting our findings. First, the occupational cohort utilized in the study was relatively small and from a single National Guard Brigade Combat Team. As noted by Riviere et al. (2011), National Guard brigades, unlike active component brigades, are largely composed of soldiers from a single area or state, which potentially limits the generalizability of study findings. Indeed, data from the Army and the Defense Manpower Data Center indicate that compared to the entire population of U.S. Army National Guard (NG) soldiers in fiscal year 2006, our sample was less racially diverse (U.S. Army Profile FY06). Although representative of the racial composition of the overall Brigade Combat Team and the larger RINGS cohort (Polusny et al. 2011), our occupational cohort was predominantly white (96%) compared with 74.5% of the U.S. Army NG population. In addition, we found that the veterans included in our occupational cohort were significantly more likely to be married and of higher rank than the veterans in the larger RINGS cohort, which again has implications for generalizability. The RINGS cohort more closely aligned with the national data with 90.2% enlisted status compared to 89.4% nationally and 45.4% married compared to 46.5% of the U.S. Army NG population (U.S. Army Profile FY06). Second, our dependent variables relied on instruments measuring symptoms of mental health as

opposed to clinical diagnoses. However, the BDI-II and PCL-M are symptom measures that are widely used and have good reliability and validity (Dozois et al. 1998; Weathers et al. 1993). In addition, there is growing recognition that post-deployment psychological problems need not be present at clinical levels to have a significant negative impact on personal and occupational functioning (Ford et al. 2001). Finally, the numbers of veterans experiencing the exposures of interest were small; mean levels of job stress were 5.9 out of a possible of 10.0, and 7.9% were experiencing poor supervisor support, 9.8% were experiencing poor coworker support, and 6.1% were experiencing both. This was similar to exposure levels reported by Riviere et al. (2011) in which less than 20% of their large sample experienced a broader range of NG-specific issues.

Conclusions

Our findings provide further support for the importance of risk factors for mental health symptoms in the post-deployment time period. NGR veterans face unique challenges post-deployment as their military service is relatively part-time and they retain commitments to civilian jobs despite involvement in protracted or multiple deployments. We've shown that job stress and poor coworker support contribute to symptoms of depression in NG veterans over two years after returning from Iraq. In addition, job stress may also contribute to an increase in symptoms of PTSD in some NG veterans not already experiencing symptoms in the early post-deployment time period.

Table 50. Demographics and outcome measures – RINGS cohort vs. occupational cohort

	RINGS Cohort Brigade Combat Team (n = 522 at Time 1; 424 at Time 2)	Occupational Cohort with Complete Exposure Assessment (n = 169)
Demographics (at Time 1)		
Age at Pre-Deployment (M, SD)	29.1, 8.6	31.0, 8.8
Race (N (% White))	490 (93.9%)	162 (95.9%)
Gender (N (% Male))	462 (88.5%)	148 (87.6%)
Marital Status (N (% Married))	237 (45.4%)	96 (56.8%)*
Years of Education (M, SD)	14.2, 2.0	14.8, 2.2
Military Rank (N (% Enlisted))	471 (90.2%)	139 (82.2%)*
Occupational Status at Time 2 (N (% Employed))	244 (57.6%)	115 (68.9%)*
Outcomes (at Time 4)		
Screened positive for symptoms of PTSD† (N (%))	51 (17.3%)	20 (11.8%)
Screened positive for symptoms of depression‡ (N (%))	58 (19.7%)	24 (14.4%)

†A positive screen for symptoms of PTSD indicates a total PCL-M score ≥ 50 and endorsement of at least one intrusion symptom, three avoidance symptoms, and two hyperarousal symptoms each at the moderate or higher level.
‡A positive screen for symptoms of depression indicates a total BDI-II score ≥ 20.
*$p < 0.05$.

Table 51. Exposure assessment and covariates

	Occupational Cohort with Complete Exposure Assessment (n = 169)
Exposure Assessment	
Perceived job stress (16-18 mos) (M, SD)	5.9, 2.0
Perceived supervisor support (16-18 mos) (N (% Poor Support))	13 (7.9%)
Perceived coworker support (16-18 mos) (N (% Poor Support))	16 (9.8%)
Covariates	
Prior OEF/OIF Deployment (N (%))	6 (3.6%)
Time 2 DRRI Unit Support Scale Score (M, SD)	39.5, 10.4
Time 2 DRRI Combat Scale Score (M, SD)	27.4, 7.8
Deployment-Related Injury (N (%))	74 (43.8%)
Time 3 Mental Health Service Use	
Any MH Counseling (N (%))	84 (49.7%)
Any MH Medication Use (N (%))	35 (20.7%)
Time 3 DRRI Social Support Scale Score (M, SD)	58.5, 9.6
Time 3 DRRI Stressors Scale Score (M, SD)	1.7, 1.7

Table 52. Determinants of depression symptoms at Time 4 in NG veterans – full sample

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Perceived Job Stress (16-18 mos)	0.7070	0.2666	2.65	0.009	0.1597
Perceived Supervisor Support (16-18 mos)	-1.1277	2.3136	-0.49	0.627	-0.0355
Perceived Coworker Support (16-18 mos)	4.7243	2.3539	2.01	0.047	0.1544
Gender	-2.3518	1.4677	-1.60	0.112	-0.0908
Military Rank	0.3554	1.2961	0.27	0.784	0.0158
Prior OEF/OIF Deployment	6.8899	2.4333	2.83	0.005	0.1569
Deployment-Related Injury	1.1541	0.9237	1.25	0.214	0.0657
Time 2 DRRI Unit Support Scale Score	0.0894	0.0458	1.95	0.053	0.1053
Time 2 DRRI Combat Experiences Scale Score	0.1630	0.0696	2.34	0.021	0.1486
Time 2 PCL-M Score	-0.1193	0.0622	-1.92	0.058	-0.1778
Time 2 BDI-II Score	0.6723	0.0934	7.20	<0.000	0.5902
Time 3 Mental Health Service Use	0.7843	1.0514	0.75	0.457	0.0447
Time 3 DRRI Social Support Scale Score	-0.1296	0.0612	-2.12	0.036	-0.1243
Time 3 DRRI Stressors Scale Score	0.6897	0.3068	2.25	0.026	0.1344
Constant	0.8236	4.2083	0.20	0.845	0

R-Square = 0.6712; Adj R-Square = 0.6358

Table 53. Determinants of PTSD symptoms at Time 4 in NG veterans – full sample

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Perceived Job Stress (16-18 mos)	0.7068	0.4491	1.57	0.118	0.1004
Perceived Supervisor Support (16-18 mos)	1.6847	3.9058	0.43	0.667	0.0334
Perceived Coworker Support (16-18 mos)	0.1043	3.9709	0.03	0.979	0.0021
Gender	1.5969	2.4763	0.64	0.520	0.0388
Military Rank	2.5082	2.1860	1.15	0.253	0.0703
Prior OEF/OIF Deployment	4.5244	4.1082	1.10	0.273	0.0648
Deployment-Related Injury	2.8651	1.5497	1.85	0.067	0.1032
Time 2 DRRI Unit Support Scale Score	0.1877	0.0765	2.45	0.016	0.1408
Time 2 DRRI Combat Experiences Scale Score	0.3308	0.1158	2.86	0.005	0.1916
Time 2 PCL-M Score	0.1347	0.1044	1.29	0.200	0.1263
Time 2 BDI-II Score	0.6247	0.1573	3.97	0.000	0.3453
Time 3 Mental Health Service Use	2.0631	1.7712	1.15	0.252	0.0734
Time 3 DRRI Social Support Scale Score	-0.2526	0.1032	-2.45	0.016	-0.1525
Time 3 DRRI Stressors Scale Score	1.2465	0.5162	2.41	0.017	0.1532
Constant	5.1011	7.0948	0.72	0.473	0

R-Square = 0.6246; Adj R-Square = 0.5848

Table 54. Determinants of depression symptoms at Time 4 in NG veterans – subgroup without positive screen for PTSD or depression at Time 2

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Perceived Job Stress (16-18 mos)	1.1967	0.3068	3.90	0.000	0.3031
Perceived Supervisor Support (16-18 mos)	-1.2676	2.5392	-0.50	0.619	-0.0475
Perceived Coworker Support (16-18 mos)	3.9422	2.6270	1.50	0.137	0.1400
Gender	-4.1960	1.8118	-2.32	0.023	-0.1651
Military Rank	0.8952	1.3091	0.68	0.496	0.0509
Prior OEF/OIF Deployment	5.7313	3.1694	1.81	0.073	0.1274
Deployment-Related Injury	1.0470	0.9927	1.05	0.294	0.0736
Time 2 DRRI Unit Support Scale Score	0.0809	0.0503	1.61	0.111	0.1124
Time 2 DRRI Combat Experiences Scale Score	0.1752	0.0879	1.99	0.049	0.1559
Time 2 PCL-M Score	-0.1582	0.0830	-1.91	0.059	-0.1939
Time 2 BDI-II Score	0.6923	0.1297	5.34	<0.000	0.5109
Time 3 Mental Health Service Use	0.2335	1.0523	0.22	0.825	0.0165
Time 3 DRRI Social Support Scale Score	-0.1086	0.0678	-1.60	0.112	-0.1189
Time 3 DRRI Stressors Scale Score	0.8750	0.3507	2.49	0.0142	0.1881
Constant	-0.6708	4.8628	-0.14	0.891	0

R-Square = 0.5463; Adj R-Square = 0.4853

Table 55. Determinants of PTSD symptoms at Time 4 in NG veterans – subgroup without positive screen for PTSD or depression at Time 2

	Coefficient	**Standard Error**	***t***	***P* > |t|**	**Beta Coefficient**
Perceived Job Stress (16-18 mos)	1.4560	0.4965	2.93	0.004	0.2371
Perceived Supervisor Support (16-18 mos)	2.6940	4.1165	0.65	0.514	0.0648
Perceived Coworker Support (16-18 mos)	-3.6118	4.2649	-0.85	0.399	-0.0823
Gender	0.8315	2.9423	0.28	0.778	0.0210
Military Rank	3.0890	2.1248	1.45	0.149	0.1129
Prior OEF/OIF Deployment	5.6766	5.1470	1.10	0.273	0.0809
Deployment-Related Injury	2.3129	1.5959	1.45	0.150	0.1052
Time 2 DRRI Unit Support Scale Score	0.1626	0.0806	2.02	0.046	0.1474
Time 2 DRRI Combat Experiences Scale Score	0.2906	0.1386	2.10	0.038	0.1702
Time 2 PCL-M Score	0.1156	0.1339	0.86	0.390	0.0911
Time 2 BDI-II Score	0.6267	0.2089	2.99	0.004	0.2971
Time 3 Mental Health Service Use	1.8654	1.7059	1.09	0.277	0.0852
Time 3 DRRI Social Support Scale Score	-0.2229	0.1101	-2.03	0.045	0.1568
Time 3 DRRI Stressors Scale Score	1.0856	0.5674	1.91	0.058	0.1502
Constant	3.0581	7.8551	0.39	0.698	0

R-Square = 0.4985; Adj R-Square = 0.4323

Chapter 6: Conclusions and Future Implications

In a high risk group of veterans, service members of the National Guard (NG), within the context of civilian reintegration, this two-paper exam examined the transition to civilian employment following deployment and sought to identify strains and stressors that are associated with the development of post-deployment mental health symptoms. Civilian reintegration is the process of military personnel transitioning back into personal and organizational roles and society following deployment. The body of literature on reintegration is limited but growing as the current conflicts continue in the Middle East. As service members return home, our newest generation of veterans from Iraq (Operation Iraqi Freedom; OIF and Operation New Dawn; OND) and Afghanistan (Operation Enduring Freedom; OEF) are faced with the task of reintegrating into potentially disrupted family, social, and occupational roles (Sayer et al. 2010; Milliken et al. 2007; Seal et al. 2009).

Dating back to the American Civil War (1861-1865), post-war mental health and readjustment problems have been prevalent in the aftermath of wars (Wells et al. 2011). Research and scientific interest in these problems, however, really began following the recognition of the post-war readjustment problems of Vietnam War veterans (Cozza, 2005). Much of the research on Vietnam-era veterans and subsequently Gulf War-era veterans was conducted a number of years after the cessation of conflict. What is unique about the current conflicts in the Middle East is the fact that all studies conducted among Iraq and Afghanistan deployers have been conducted while operations remain ongoing in near real-time, an approach which allows study results to drive program responses and influence policy decisions intended to protect and improve the health of our military service members and veterans (Wells et al. 2011).

Contributing to this approach, this research examines an important feature of the civilian reintegration process in NG troops, the transition away from and then back to civilian employment, and provides further evidence that NG veterans face job-related strains and stressors both pre–and post-deployment that subsequently affect mental health symptoms. Overall, this research provides timely, new insights that will aid in the development of evidence-based, recovery-oriented interventions for returning OIF personnel.

Pre- and Post-Deployment Job Concerns and Job Change

Chapter 4 of this dissertation identifies the pre-deployment time period as a potential time to address latent civilian reintegration issues related to employment uniquely experienced by NG service members, namely job concerns regarding leaving and returning to civilian employment. The results demonstrate that job concerns are present prior to deployment and are consistently correlated with symptoms of depression and PTSD up to two years post-deployment. Particularly for NG troops, whose military service is relatively part-time and who retain commitments to civilian jobs, issues and concerns surrounding the transition to and from civilian employment may represent an important topic area to incorporate into psychological resiliency training.

Psychological resiliency training represents another hallmark change of the current conflicts made possible by deployment-related research being conducted in near real-time. There are a growing number of programs and strategies provided by the military and civilian sectors to encourage and support psychological resilience to stress for service members and their families. Future studies should continue to evaluate the efficacy of resiliency training programs at different phases of deployment and look to

incorporate the NG-specific issues and concerns we've highlighted. To date, studies have documented a link between pre-deployment training and better mental health during deployment (MHAT-II, 2005). Given our findings, it will be important to determine whether or not this type of training provides long-term benefits past the deployment phase and whether or not it's feasible to incorporate employment-related concerns into resiliency training.

Post-Deployment Job Stress and Job Support

Chapter 5 provides further support for the importance of risk factors for mental health symptoms in the post-deployment time period. A heightened risk of mental health problems among veterans exists not only immediately post-deployment, but appears to increase in the months and years following combat deployment suggesting that experiences outside of deployment itself contribute to risk (Wolfe et al. 1999; Milliken et al. 2007; Seal et al. 2009). We've shown that employment-related strains and stressors are associated with the development of post-deployment mental health symptoms; job stress and poor coworker support contribute to symptoms of depression in NG veterans over two years after returning from Iraq. In addition, job stress may also contribute to an increase in symptoms of PTSD in some NG veterans not already experiencing symptoms in the early post-deployment time period.

Overall, this research provides insights that have important implications for research and practice in this special population of veterans. Involvement in protracted deployments, and/or multiple deployments, and the transition back to civilian employment affects NG veterans in ways that can make them vulnerable to depression and PTSD. In terms of research implications, future research in this population is needed

that could extend the work of Miller and Rasmussen (2010). In the context of civilians exposed to war, they have proposed a model in which daily stressors mediate the relationship of war exposure on mental health and also have a direct effect on mental health. Based on this model, they advocate for an integrative, sequenced approach to clinical intervention in which daily stressors are first addressed followed by specialized interventions for those whose distress does not abate when daily stressors are lessened (Miller and Rasmussen 2010). Recognizing the unique needs and circumstances of NG veterans, similar interventions should be developed and tested, which leads to implications for practice in this special population of veterans. Wells et al. (2011) identified primary care as a promising early intervention opportunity for service members and veterans with PTSD and other mental health problems given increasing evidence that system-based primary care approaches lead to improved mental health services and outcomes for common mental disorders in both military and civilian populations. Such approaches include routine screening for symptoms and risk factors for PTSD and depression, which could easily be extended to include job-related strains and stressors given our findings.

In conclusion, the wars in Iraq and Afghanistan represent the longest sustained military operations since the Vietnam era. By the end of 2010, more than 2.2 million U.S. service members had deployed to Iraq (Operation Iraqi Freedom; OIF and Operation New Dawn; OND) and Afghanistan (Operation Enduring Freedom; OEF) since September 11, 2001. National Guard and reserve (NGR) troops represent one-third of all troops deployed to Iraq and Afghanistan, and face unique reintegration challenges given that their military service is relatively part-time and they retain commitments to civilian jobs,

despite involvement in protracted or multiple deployments. A key feature of the reintegration process is the transition away from and then back to civilian employment. Our research demonstrated in a high risk group of veterans, service members of the National Guard (NG), civilian reintegration issues related to employment are important risk factors in the development of post-deployment mental health symptoms and problems, which has important implications for research and practice in this special population of veterans.

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